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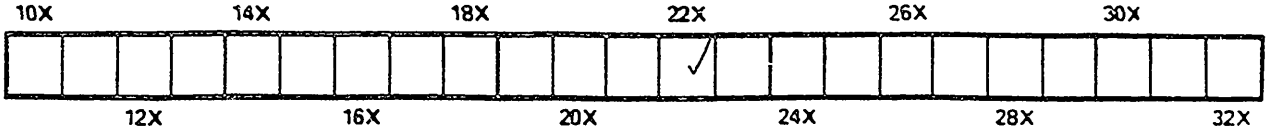

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LIGHT.

THE following poem has been pronounced by English critics to be the finest production of its length in the language:

From the quickened womb of the primal gloom,
The sun rolled, black and bare,
Till I wove him a vest for his Ethiop breast,
Of the threads of my golden hair;
And when the broad tent of the firmament
Arose on its airy spars,
I pencilled the hue of its matchless blue,
And spangled it around with stars.

I painted the flowers of the Eden bowers,
And their leaves of living green,
And mine were the dyes in the sinless eyes
Of Eden's Virgin queen;
And when the art in the thoughtful heart
Had fastened its portal spell,
In the silvery sphere of the first-born tear
To the trembling earth I fell.

When the waves that burst o'er a world accursed
Their work of wrath had sped,
And the Ark's lone few, tried and true,
Came forth among the dead,

With the wondrous gleams of the bridal beams,
I bade their terrors cease,
As I wrote on the roll of the storm's dark scroll
God's covenant of peace.

Like a pall at rest, on the senseless breast,
Night's funeral shadow slept—
Where shepherd swains on Bethlehem's plains,
Their lonely vigils kept.
When I flashed on their sight, the heralds bright,
Of Heaven's redeeming plan,
As they chanted the morn, the Saviour born—
Joy, joy, to the outcast man.

Equal favor I show, to the lofty and low,
On the just and unjust I descend;
E'en the blind, whose vain spheres, roll in darkness and tears,
Feel my smile, the best smile of a friend.
Nay, the flower of the waste, by my love is embraced,
As the rose in the garden of kings;
At the chrysalis bier of the morn I appear,
And lo! the gay butterfly's wing.

The desolate morn, like the mourner forlorn,
Conceals all the pride of her charms,
Till I bid the bright hours, chase the night from her flowers,
And lead the young day to her arms;
And when the gay rover seeks Eve for her lover,
And sinks to her balmy repose,
I wrap the soft rest by the zephyr-fanned west,
In curtains of amber and rose.

From my sentinel steep by the night-brooded deep,
I gaze with unslumbering eyes,
When the cynosure star of the mariner
Is blotted out from the sky:

And guided by me through the merciless sea,
Though sped by the hurricane's wings;
His compassionless, dark, lone, weltering bark,
The haven home safely he brings.

I waken the flowers in the dew-spangled bowers,
The birds in their chambers of green,
And mountain and plain glow with beauty again,
As they bask in their matinal sheen.
O, if such the glad worth of my presence on earth,
Though fitful and fleeting the while,
What glories must rest on the home of the blessed,
Ever bright with the Deity's smile.

—WILLIAM PITT PALMER.

MY FRIEND "WOOSTER."

"WHILE I sat half murmuring, half meditating these unprofitable speculations, with my head resting on my hand, I was thumming with the other hand upon the quarto until I actually loosened the clasps; when, to my utter astonishment, the little book gave two or three yawns, like one awaking from a deep sleep; then a husky hem and at length began to talk. At first its voice was very hoarse and broken, being much troubled by a cobweb which some studious spider had woven across it; and having probably contracted a cold from long exposure to the chills and damps of the Abbey. In a short time, however, it became more distinct, and I soon found it an exceedingly fluent, conversable little tome."—*Washington Irving.*

I do not believe in ghosts or goblins, spirits or spooks—in fact, I take some pride in my utter contempt for superstition. I have always thought that if the spirits of our departed friends were to revisit this world in visible form they would be more particular about the times and localities in which man claims to be honored. The actions also ascribed to them would lead one to

believe that the future world does not improve the ideas as to the object of man's life. No, I am not superstitious, yet—but wait, I'll tell my story, and then you can do the moralizing.

My surroundings are not at all peculiar or extraordinary, the principal objects that meet the gaze being books and books and books. My companions, like myself, are somewhat addicted to the habit of reading, and, like all the rest of the world, are peculiar in their several lines of thought and action.

Often as we have gathered around the stove on a dull and dreary evening to revolve and rerotate the events of the day, we have been aroused by sounds and noises that have baffled our investigation. As some one of us would give but slight attention to the utterance of a word, or would dress out some old friend in a new and unfamiliar garb, a muttered ejaculation, a sigh, sometimes a deep groan would fall upon our ears. Again, a light ripple of laughter, a half-smothered outburst of merriment, would startle us. We ascribed it to the wind and to our imagination.

We had been talking over the foolishness of mankind in general, and ourselves in particular, and as a result my mind was turned towards the subject of crankiness. I sat down by my desk and began to write. I decided to write up the fools—an endless subject, a foolish subject, I suppose you say. I began, and as I wrote my attention was distracted by sounds and movements that perplexed me.

"There is something in every man's heart, that, if you knew it, would make you hate him." Thus sadly and morosely has Goethe spoken; our consolation and hope lies in the "if," which robs the threatening viper of the sting. Lytton, improving on the above, has told us that "in every man's nature there lies a something, could we get at it, cleanse it, polish it, render it visibly clear to our eyes, would make us love him." Whether we love a man or hate him, therefore, depends to a great extent upon the limited knowledge we have of him. To know a man perfectly means to arouse both our love and our hatred. Who can picture the state of affairs in this world if men were to

appear as they really are? As masks fell off and truth became apparent, methinks the world would become at first a collection of isolated beings, struck dumb and motionless with surprise. Each being would feel himself a stranger in a strange land, the most unfamiliar and unrecognized form being that of himself. Each man, then, our authorities say, has his side of love and his side of hatred. So also he has his side of pity, of sympathy, of humor, and of oddity. Man is indeed a many-sided animal. Increase the number of the sides until each blends with and loses its identity in the whole circle, and our polygonal man becomes a "well-rounded man." This perfect symmetry is seldom, if ever, found: some side preponderates, and the harmony is marred. This preponderance of one side over the others, this "leaning" in one direction, this excessive development, is termed specialism, oddity, tendency, fanaticism, ambition, insanity, crankiness. We are all odd, insane, cranky. This, then, is a world of fools, and the wise man is the fool of fools. In a world of cranks it would be strange did one not *sometimes* meet a crank. I do not ask your pardon if at times you see me stand before you holding out my hand and nodding in a familiar manner. Doubtless I shall often be the fool shaking hands with himself. Where all are fools no one need excuse himself; where all are insane, sanity would be madness. Do not pride yourself on being omitted from my list, for you may thereby prove yourself a double fool—a fool of pride and a fool of ignorance.

Have you ever watched the uncertain movements of a man of caprice?

"I have." I looked up in astonishment. The words were followed by an upheaval of my books before me: classics, science, English volumes were tumbled over, and a big volume in the furthest corner was slowly pushing himself free, shaking out his leaves, and brushing off the dust that had been accumulating for months. I seized the volume and laid it before me.

Thanks. Phew! a breath of fresh air smells good. Don't you recognize me? No! Well, that's strange. You have

treated an old friend rather harshly. You thought you could keep my mouth closed by burying me beneath these other insignificant fellows. For weeks past I've been groaning at *your mistakes and chuckling at your ignorance*, and you have not even deigned to consult my feelings once. But, my friend, I can stand it no longer. You have the dumps. Yes, you are apt to take a harsh view of life, and are now trying to raise yourself by pulling down all the rest of mankind. You *are* a fool. I am somewhat talkative (and no wonder); so, without your permission, I'll proceed and tell you a thing or two. My name is Wooster (note it well), and I am the most important and least respected of your friends. You think I am a dry old stick, that my knowledge consists of antiquated rubbish. Listen! You were talking about a man of caprice. Did you ever think what that means? A man of caprice is a man who capers, frisks about, runs hither and thither, leaps ditches and fences, runs butt against all obstacles, and takes keen delight in climbing at the risk of life, that he may satisfy idle and unaccountable curiosity. The man of caprice is the man who exhibits the traits of the goat (Latin, *caper*, a goat). There is an uncertainty about such a man's actions that appears to defy explanation. Let us, if possible, follow the goat, and we may perhaps account for some of the uncertain actions of the capricious man. *The frollicking, frisking, daring goat climbs roofs*, stumps, and fences, leaps ditches and gates, because it is natural. He unconsciously remembers the time when he roamed free upon the hills and crags as a wild mountain-goat, when he *had* to climb and *had* to leap. Turn out the domestic goat upon the bleak, rocky hills, and he will soon revert to his former condition. The peculiarities of goats are easily explained by a reference to their origin. They are imitative and sequacious by heredity. A whole flock of sheep, the most domesticated of this race of mountain climbers, will follow their leader through the same opening, jump a ditch in the same place and exactly in the same manner, leap over imaginary obstacles in exact imitation, and in every way prove their faithfulness to ances-

tral instincts. It was absolutely necessary for them to follow their leaders. Thus the man of caprice, by his restlessness and capering, is but working off the former freedom and daring, which modern society restrains and holds in check."

"Well, you are an odd fellow," I said.

"Ha, ha, that is pretty good. A fellow means one of a pair: odd means solitary, unmatched; so that, if I were an odd fellow, I would be an unmated person having a mate—a rather uncertain being."

"As eccentric as most men."

"As eccentric as a comet, you mean. Eccentric, in plain terms, means 'off my centre,' deviating from the true line of a circle, revolving in an orbit that at first appears different from that of other bodies—irregular, uneven, uncertain in my movements. An eccentric planet or comet moves according to fixed laws just as much as the earth—the fact is, all the orbits are more or less eccentric. I may be eccentric, but I do not thereby differ from others."

"Then you are peculiar, particular."

"The particular man is the one who looks after the *little parts*. Great things are made up of little parts. The peculiar man is the man who belongs to himself, or to only one, or who looks after his own peculiar business, his own property, his own cattle (*pecus*, cattle)."

"Then you are comical, unique, strange."

"Comical simply means making merry at the village festival; unique means being one, not double-faced, always the same; and a strange person is a foreigner (extra, beyond). Well, perhaps I am a foreigner to you; one thing is certain, my language is not always yours. You think I am to be slighted for these dead Greeks and Romans, these flippant Frenchmen and stern Germans. You call me dull, and heavy, and stupid, and tiresome. My friend, you do not know me. Keep me here at your side, use me as you would a friend, and I'll help you throw off the drowsiness of many an hour; I'll introduce you to a realm of thinkers whose words will have new force and

meaning; I'll develop your own thought and language, so that some day you also—"

"Excuse me one moment," I said; "I am now most thoroughly convinced that I have been a fool. I have been digging among the sands for springs, while here I might have found deep, ever-flowing fountains."

"I am satisfied," and the leaves fluttered together again, the lids closed, and "Wooster," with becoming modesty, sank into a quiet, satisfactory snooze. He and I henceforth will be better friends. Do you know him? If not, strike up an acquaintance with him or his cousin, Webster. You will find them both interesting and profitable companions, and often, when disposed to mistake your own blurred eyesight for the darkness of the outer world, you will find that, among your most sociable and sprightly friends is your UNABRIDGED DICTIONARY.

CANADIANS OF THE FUTURE.

CANADIANS, as a rule, do not often startle the world by great discoveries or inventions—a fact at which we need not be discouraged or disappointed. The future, we hope and believe, will in this respect prove different. Amongst the men who have of late years added valuable and original investigations to various departments of research, might be mentioned Drs. Wilson, Watson, Dawson, Haanel, and Young, each a specialist in his own particular department. Dr. Young, of Toronto University, has been most generally known as a worker in the domain of metaphysical science, but to the students of science in its highest development he has been long famous as a mathematician, standing in this perhaps as the most original on the continent. It is not our intention to give a *resumé* of his latest achievements; suffice it to say that he has developed a new method of investigation and solution in reference to equations. Claims are being advanced also in behalf of other workers along similar lines. The results of all will soon be placed in available form. In view of these facts,

we have heard and seen the prophecies of some that the *forte* of Canadians lies in the direction of mathematics, that our great men to come are to startle the world by their mathematical investigations. Perhaps so—we indeed hope so. But we fail to see the force of the arguments adduced to support this opinion. Wherein, then, lies the field, if any (and we trust there is some field), in which Canadian skill and insight is to manifest its power? It is hard to say; yet, since prophecy is as easy and as universal as advice, we would beg to add our opinions and suggestions.

Great and startling discoveries are not to be expected from a people in its formative condition. Not until the great foundation stones have been laid and the general structure has been outlined, can we hope to see the peculiarities of shape, the style of architecture, the special tendencies in design. Our nation is being constructed from material most diverse in quality, most different in quantity. The superficiality of the Frenchman, the close scrutiny of the German, the philosophy of the Scotchman, the sentimentality of the Irishman, the solidarity of the Englishman, and the heterogeneous elements of many other nations, oriental and occidental, must blend and commingle—nay, more, they must adapt themselves to, and be influenced by, the climate and general natural characteristics of our land. The Frenchman becomes a French-Canadian, the Englishman an Anglo-Canadian, and so on. The people of other lands must do in Canada as Canadians do, and in time must think as Canadians think, that is, as the climate and scenery compel them to think. The process of assimilation will be gradual, but certain; and from the different races now moving toward our shores we may confidently expect a strong, sturdy, determined, influential race; for we lie within the zone of progress that is slow but sure. It will be interesting to watch the influence of our energizing atmosphere and varied natural scenery upon the peculiarities of the older races of Europe. The natural channels of communication now existing upon this continent warrant the belief that here, in time, we shall see a fusion of all races into one compact, homogeneous

body. What shall that united people be? What the general characteristics? What the tendencies? An Englishman is an Englishman the world over, we have been told. This is true only within short periods of time: for the laws of nature, the necessities involved in the maintenance of life, the influence of environment, will in time change and reform the man. The time of complete fusion may be far ahead, the foundations of nationality may be long in settling, and the interval may develop and reveal new and most important influences: so that at the start the task of prophecy may be both vain and foolish. Yet if we judge by the great natural resources of our country, we cannot be deceived in believing that a class of geologists, mineralogists, and biologists will rise in our midst to rival the most famous of other lands. As a writer in the *Week* has also stated, we may hope for great things along the line of scientific agriculture and forestry. These sciences will develop, owing to our resources. Coupled with these, that universal and fundamental science, physics, will gather round her many followers. Mathematics is the handmaiden of physics. Physics and chemistry lie at the basis of our manufactures: they develop together. Mathematics has a strange companion, metaphysics, the after-physics: but until the pulse of our young nation learns to beat more slowly and regularly we do not predict a national tendency towards the study of speculative science. What of the science of language? The dead tongues, we believe, shall be left behind in the classic halls of the old world until, in future years, time and inclination will lead back the minds to the buried ages, and the revival of Sanscrit, Greek, and Latin will be contemporaneous with metaphysical research. As for the modern languages, the presence in our midst of the representatives of English, French, and German will give impetus to the study of these useful tongues. What of literature? The fields of Canadian literature are now quite fallow: a wild flower here, a foreign weed there being the only signs of a scanty vegetation. Who knows what seeds may not yet be dropped by the winds and give rise to a most luxuriant growth? If necessity is the mother of invention, we should

hope for great results along the line of social and political science. In a word or two, Canadian character and personality will depend upon what we make it, and our making will depend, to no small extent, upon the influence of climate, scenery, and natural resources. Again, the latter may change, will change in course of time. The incoming of man will in many ways change both climate and resources. Thus our problem reveals a most involved and complicated set of interdependent causes, and what the effect will be we dare not venture to predict. We were going to prophesy, but we refrain. Remembering that "a prophet is not without honor save in his own country," we shall only say that *perhaps* the Gulf Stream will change its course, or the great Ice Age will again enshroud us, ere the dawn of the great day when Canadians will startle the world and lead the van in *all* the sciences, physical, mental, and moral. Let us hope for better things, for brighter days.

LYTTON IN A NEW ROLE.

WE common fools at times feel no little bit of selfish satisfaction by the addition to our number of an uncommon fool. This time, however, we may fairly feel somewhat sad to see the glorious reputation of a great man tremble, waver, fall, and crumble into dust—nay, worse than dust, for from the heap there rises an effluvium that disgusts and sickens. We can somewhat pardon Lord Lytton in his "puppyism" if we remember that it requires a great man to make a great fool. Could we invert the statement we would pay too high a compliment to the author of *Rienzi*, *Zanoni*, or *Kenelm Chillingly*. But, alas! Were we too hard-hearted, we might class crabbed Carlyle, hot-tempered Byron, perhaps even excitable Tennyson, and many others, in a category with Lytton, as a class of beings whose wives are not to be envied.

"Did oo not look too pretty, and did not all the puppy dogs run after oo and tell oo what a darling oo was? Ah, me sends oo nine million kisses, to be distributed as follows—500,000 for

oo beautiful mouth, 250,000 to oo right eye, 250,000 to oo left eye, 1,000,000 to oo dear neck, and the rest to be divided equally between oo arms and hands."

Thus wrote Edward Bulwer Lytton to Miss Wheeler, "My adored Puppy," in the year of courtship. Eight years afterward upon the lovely cheek of Lady Lytton he was able to leave a lasting imprint of his affection. The licking, slobbering poodle had become the maddened, venomous bull-dog. Having refused to reply to a remonstrating question, Lady Lytton says: "Springing on me he made his great teeth meet in my cheek, and the blood spurted over me." That was a kiss not to be forgotten. Fifty years of remembrance but added to its sting, and now upon the fame and reputation of the great novelist it will ever remain a blot and stigma.

"My soul hungers and thirsts after your writeousness"—the punning poodle, the puny pug.

"Asparagus Acorn Pup Bobadil of Boots" is too suggestive. Why did he not term himself a "mixed metaphor" and save time and reputation?

"Me is so happy, me is wagging my tail and putting my ears down. Me is to meet oo to-morrow. . . . . The best plan about the carriage will be for you to get in it first and it can then pick me up in another street, so that you will enter it alone. When you are once in put down ye blinds. O zoo love of loves, me ready to leap out of my skin for joy."

Well had it been for him had he then leaped out of his skin, for now a curious and unsympathetic public would not be mockingly tearing into shreds his leopard-spotted hide. Heretofore we have looked upon him as Lytton the fascinating, imaginative writer, the classical author, the ethereal-minded being: henceforth we shall remember him as Lytton the founder of the curious Pupology. Lytton's life, past and present, gives some additional force to the old saying, "Hell hath no fury like a woman scorned." Earth hath no puppy like an intellectual pup.

Even with this lately-published collection of 298 silly love-letters added to his authorship, with the stigma of wife-beater

added to his characteristics, we feel that Lytton will long maintain a high position as one of England's most polished novelists. We shall have to allow these latest productions somewhat to fade from memory, however, before we pick up *Pelham*, *Richelieu*, or *My Novel*.

THE LAY OF THE LAST VORTEX-ATOM.

(*Vide*.—"The Unseen Universe.")

THE Vortex-Atom was dying,
The last of his shivering race—
With lessening energy flying,
Through vanishing realms of space.

No more could he measure his fleeting—
No milestones to mark out his way;
But he knew by his evident heating,
His motion was prone to decay.

So he stayed in his drift rectilinear,
For time had nigh ceased to exist,
And his motion grew ever less spinnier,
Till he scattered in infinite mist.

But as his last knot was dissolving
Into the absolute nought,
"No more," so sighed he resolving,
"Shall I as atom be caught.

"I've capered and whirled for ages,
I've danced to the music of spheres,
I've puzzled the brains of the sages—
Whose lives are but reckoned by years.

"They thought that my days were unending,
But sadly mistaken were they;
For, alas! my 'life force' is expending
In asymptotic decay!"

EDINBURGH UNIVERSITY.

"WELL DONE."

THAT wrong should be stigmatized, and that the right, the noble, the heroic act should be acknowledged, encouraged and honored, are facts in most perfect accord with all that is highest and best in humanity. When we see a man degrade himself or injure his fellows, our hearts instinctively cry out "ill done;" but, on the other hand, when we see a man constantly struggle to perfect himself and benefit humanity, our hearts enthusiastically greet the hero with "well done." Yet it is our infirmity that we do not say "well done" unless the occasion is strongly marked. When a man discovers a planet, or on this planet discovers what may be called a new world; when a man invents printing, discovers the powers of steam, invents the electric telegraph, or when he

> "Breaks his birth's invidious bar,
> And grasps the skirts of happy chance,
> And breasts the blows of circumstance,
> And grapples with his evil star;
>
> And makes by force his merit known
> And lives to clutch the golden keys,
> To mould a mighty state's decrees,
> And shape the whispers of a throne;
>
> And moving up from high to higher,
> Becomes on fortune's crowning slope
> The pillar of a nation's hope,
> The object of a world's desire;
>
> Yet feels, as in a pensive dream,
> When all his active powers are still,
> A distant dearness in the hill,
> A secret sweetness in the stream,
>
> The limit of his narrower fate,
> While yet beside its vocal springs
> He played at counsellors and kings,
> With one that was his earliest mate"—

when we see such a one rising so high and yet possessing a heart so humble and tender, we exultantly cry out, "well

done." But should he, on the common level, faithfully perform his duty to God, himself and humanity, it is more than probable that the words "well done" would never greet his ear: and yet the man who never rises above the medium, may have done better than the man who has reached the highest pinnacles of fame. This leads us to enquire, how must our acts be characterised in order to merit both the divine and human "well done?" I notice that they must be good in themselves. They must manifest deep reverence for the absolutely good: that is, God, justice toward ourselves and humanity, together with earnest effort to rise to the strongest, kindest, purest manhood ourselves, and to lift others to the same plane of living. Let our acts be vicious—let them tend to fret, worry, annoy, weaken, dispirit, or in any way injure our fellow-men or ourselves, or let them be aimless, and no matter with how much energy they may be performed, their viciousness or aimlessness will brand them with *ill done.* In a word, the man who by wrong action, by inaction, or by aimless action, throws a straw in the way of the highest physical, mental, or moral development of the human race, fails to act the part of a true servant of God or a true brother of humanity. Indeed, such a man becomes a hurtful resistance, and greatly retards humanity in its struggles after the pure and good. To merit approval our acts must be good.

Again, if we would secure the "well done" of the Highest, of humanity, and of our own hearts, our actions must be well meant. We never thank a man who does us good, when he intends our hurt. Nor should we. Often the hard and bitter things which are said of us and the unkind acts which are performed towards us prove the occasion of very great good. They lead us to seek greater degrees of mental and spiritual life. But surely those who by them intended our hurt, are not to be praised for their efforts. It must be admitted that what we mean has a mighty influence, as it regards merit or demerit, on what we do.

Once more, in order that our actions secure for us the

approval for which every true heart pants, they must be performed with an energy and earnestness and a constancy somewhere in proportion to the advantages we enjoy. It is a grand thing to live true to our highest conviction of duty, even when every external circumstance is favorable; but it is incomparably grander to do the right even in the face of fearful odds. It is good to be born well—with strong tendencies toward the right—and to hold fast our possession; but it is infinitely more praiseworthy when born mud to die marble. The effort to outgrow mental and moral weakness, and to incorporate into the mental and spiritual life those habits of honesty, industry, perseverance, faith, and reverence for everything worthy of reverence, is worthy of all praise.

The fact is, we never can rightly mete out "well done" to any one without first making ourselves acquainted with his environment. The knowledge of what a man has done to make himself even what he mentally and spiritually is, would often change the contemptuous smile to a hearty "well done." Anyhow, there are many who have struggled more intensely to reach the low level on which they walk, than those who, with favoring gales, have been wafted higher. What *I* desire to emphasize is, that the course of action which in one set of circumstances would merit "well done," in a higher set of circumstances might be deemed below the commonest level.

As our hearts intensely desire the approval of God, humanity, and ourselves, let us do good and good only; let us mean to do it, and whatever good thing our hands find to do, let us do it with all our might.

"Oh that our souls would but poise and swing,
Like the compass in brazen ring,
Ever loyal and ever true
To the toil and the task we have to do,
We would sail securely, and safely reach
The fortunate islands, on whose shining beach
The sights we see and the sounds we hear
Will be those of joy and not of fear."

—TUCK.

AMERICAN RIVER NAMES—THEIR ORIGIN.

ALL the primitive races of the earth are known to have used, in the structure of their river nomenclatures, the same common universal syllabic expressions designated as terms which have the significance of water with its varying conditions. These are known by man in every phase of his existence, and may be traced back from one language to another till we fix them in the oldest of all known languages.

The Indian of North America used the same terms in his river names as the races who subdued Europe, Asia, and Africa.

By looking at terms, therefore, we may derive a clearer knowledge of the origin of some of our river names, as well as a more intelligent idea of the manner in which the Indian betrayed his acquaintance with the civilized tongues, and if the matter were faithfully followed up, the perplexing question of "Who were the first colonists of America?" would be on a fair way to solution. To do this, however, in this article would require more space than is at our command, and for the present we can only touch the matter briefly by giving a few examples.

Abana of Damascus—one of the most ancient river names now in existence—contains two of the terms before alluded to, "*aba*" and "*na*." The literal translation of this word, as a Hebrew expression, is "waters" "sure": that is, waters that are always flowing from a never-failing source.

First, then, looking at *aba*, we find that other languages, which are either dialects of, or cognate with the Hebrew, use it in different forms. For instance, the Sanscrit, which, like the original Hebrew, omitted the vowels, leaving the translator to fill up the omission from his imagination, often had "ap" as the significant for water.

In the Dacian or Wallachian, the word is written as "apa," which is really the same, "p" and "b" being almost interchangeable in the old languages.

The Arabic has the final syllable "ba," or, as it is sometimes written, "bar," or "bahr," the latter containing part of an

additional term which is known in the river nomenclatures of all nations—the Sanscrit word "ri." The idea expressed by "ri" is that of a rapid stream rushing impetuously on its course. This term, as has been said, is found in the river names of all peoples, always expressive of running water. It is seen in the Bramapootra of Asia, the Niger of Africa, the Rhine, the Rhone, and the Dneister of Europe, the Missouri and Niagara of America, and in numerous other river names all over the world.

In the last river mentioned, Niagara, "ri" appears with an "a," and "na" with an "i," the true word being Naagari, or, more correctly still, Nooghari, another term appearing *aga* or *ogha*.

In the early Semitic language there was another term for river besides aba, which literally only means "water." This term has been lost in the original, but comes up in the Sanscrit as ogha, from which our word ocean. In the Celtic it is written as acha or achi, the origin of the Latin aqua. In the ancient Germanic or Teutonic language of Europe, acha appears as aha or ahha, the defect in the German tongues preventing the pronunciation of certain digraphs, possibly accounting for the disappearance of the "c."

So far, we have only noticed the terms for "water," "river," and it will now be our task to give a little attention to the adjectives belonging to those terms.

"Ma" *(aba na)*, as may have been seen, denotes constantly flowing waters. De, or dee, was another term in the ancient speech used in connection with water. It is seen in the Sanscrit words dena and deap, and is supposed to be the root of our word deep. "Dena" is the flowing *deep* water, while "Rina," another Sanscrit word, is the *rapid* flowing water.

In considering these river names, it must be borne in mind that the vowel sounds are given in different ways. As is easily seen, this is due to the fact that the expressions of sound have no common uniform and arbitrary orthographies in the language of men. For instance, aba is written oba, uba, obi, and

ubi. In America it is written as obey (a river in Tennessee), and Yuba (a river in California), and in Africa as Yubiri—"aba," with the addition of "ri."

The Persian method of expressing aba by ab or aub is seen in the Asiatic rivers Punjaub, Murjaub, and Chenaub. There are more than fifty rivers in Europe which have forms of aba and apa in their names, and the river nomenclature of this continent contains equally as many.

The Persian sound is recognized in Catawba, Senatoba, Manitoba, while the pure Sanscrit appears in Apa-lacha, Al-apa-haw, Sax-apa-haw, and in Messi-apa, the original of the word Mississippi.

The very name *abana* is found in the Indian word written abanay.

The Celtic term acha is seen in Oswegatchie, Caloosatalchie, Choctawhatchie, etc., also in many of the European rivers, such as Atcheen (in Sicily), Acheen (in Germany).

The pronunciation of ach is prevalent all the world over, and is so very similar in many instances to the sound of the initial syllable in ogha that it is often a difficult matter to determine to which a corruption is due, whether to acha or ogha. Although this difficulty meets us in the Indian nomenclature, yet on looking over a list of their words many and striking similarities to those in the Old World are seen, a few of which we will notice.

The Indian name Saratoga has an exact counterpart in the Saratowka of Russia.

All over the world are Garris and Garras. We have it in the Indian Garry and Gauriba.

Among the river names of the Old World are found Coosey or Koosi. There are more than a dozen in the Indian nomenclature.

Moose is a native Indian name. In Europe and Asia it is written Mousa.

The Wolga is a river in Europe, the Wolkee in Alabama.

The Congo is in Africa; in America it is the Concho and the Congaree.

Sarabat is in Asia; Sarabita in America.

The Genesee is like the Yenesee of Russia. The Onega of Russia also bears some similarity to the Oneida of America.

Shocco or Soco is a river in Europe, and is also in the Hebrew of the Old Testament. As Shockoe and Soco it is in the Indian nomenclature from Maine to North Carolina.

Chili comes out in Pee-che-lee, a Japan river.

Ujiji, of Africa, finds its likeness in the Gujuy of the Indian.

Oochee is found in many of the river names of the world—in Russia, China, France, Scotland, and often in the Indian. From this comes Onichatu (now Washita or Wichita).

The name Canoochee, of the aboriginal American, which is very like the Asiatic word Canogia, gives us a descriptive epithet evidently borrowed from the Greek.

There are more than a score of Indian names applying to rivers bordered by the canes—names having in their structure the Greek *canna*.

The previous examples tend to convey the idea that the river names of America were not devised in ignorance of the language of the Old World.

The occasional use by the Indian of coincident phrases, etc., might be brought about by accident, but it would seem hard to believe that where the nomenclature of the New World is so similar to that of the Old, there was no previous knowledge of other and pre-existing models.

Examples have been given proving the familiarity of the Indians with the languages anterior to Greek and Latin, and it may be our purpose at some future time, by further illustration from river nomenclatures, to show that the aborigines possessed idioms and phrases which cannot be traced beyond the time of the Latins.

NOTE.—For many of the above examples we are indebted to an article in the *Magazine of American History*.

ADDRESS TO THE BIOLOGICAL SECTION OF THE BRITISH ASSOCIATION.

BY H. N. MOSELEY, ESQ., M.A., F.R.S.,

Linacre Professor of Human and Comparative Anatomy in the University of Oxford, President of the Section.

IN appointing the phenomena of pelagic and deep-sea life as one of the subjects specially selected for consideration at the present meeting of this Section, the Organizing Committee have, I think, done wisely. Our knowledge of the subject is at present in most active progress. It is one of widest and deepest interest to the physiologist as well as the zoologist, and in some features claims a share of attention from the botanist. And the proximity here of the United States, to which science is indebted for so many important discoveries on deep-sea matters, is a strong argument in favor of the subject being brought forward at a British Association meeting on this side of the Atlantic. I have naturally been led to choose the consideration of some deep-sea biological questions as the subject of my address by the special interest which I have been led to take in deep-sea phenomena generally, owing to my long participation in actual deep-sea research during the voyage of H.M.S. "Challenger."

Unfortunately, the physiology of the deep-sea life has until lately received but little attention from professed physiologists. No physiologist has, as far as I am aware, as yet set forth comprehensively and dwelt upon the numerous difficulties which are encountered when the attempt is made to comprehend the mode in which the ordinary physiological processes of vertebrata and other animals are carried on under the peculiar physical conditions which exist at great depths.

Whilst I was on the "Challenger" voyage, absorbed principally in the zoological discoveries daily resulting from the dredging operations, I received a letter from my revered teacher, Prof. Ludwig, of Leipzig, which brought deep-sea phenomena before me in a very different light. The professor naturally regarded

deep-sea questions mainly from a physiological point of view, and asked a series of most suggestive questions bearing on it. I am much indebted to him for this and recent letters on the same subject. One of the first questions he asked was, naturally, as to the amount of oxygen present in deep-sea water. A knowledge of the conditions under which gases occur in a state of absorption in the ocean-waters is of primary importance to the physiologist. With regard to this subject, most valuable information is contained in the report, by the distinguished chemist, Professor Dittmar, on "Researches into the Composition of the Ocean-Water, collected by H.M.S. 'Challenger,'" which has appeared during the present year, and which embody Mr. J. Y. Buchanan's results. It appears from his results that, contrary to what was before suspected, the presence of free carbonic acid in deep-sea water is an exception. What carbonic acid is present occurs as a bicarbonate, in general more or less incompletely saturated. In surface-water the proportion of carbonic acid increases when the temperature falls, and *vice versa*. Deep-sea water does not contain an abnormal proportion of loose or free carbonic acid.

Hence, with regard to Mr. John Murray's interesting discovery that after certain depths are reached *Pteropod* shells are dissolved and disappear, from the sea bottom, and at certain further depths *Globigerina* shells suffer the same fate. Prof. Dittmar holds the opinion that the solution is not due to the presence of free acid, but to the solvent action of the sea-water itself, which will, even when alkaline, take up additional carbonate of lime if sufficient time be given. Thus the amount of carbonic acid normally present throughout the ocean cannot be inimical to life; but, according to the professor, there must be in the depths of the ocean numerous bodies of richly carbonated water, for he regards the principal supply of carbonic acid to the sea-water as derived from volcanic springs and discharges issuing from the ocean-bed, the quantity derived from the decay of marine plants and animals being insignificant in comparison with this. Possibly the "Challenger," when it

dredged from deep water off the Azores immense quantities of dead and blackened coral, encountered an area which had thus been visited by a carbonic acid discharge.

With regard to the absorbed oxygen and nitrogen, the theoretical maximum quantity of oxygen absorbed at normal surface-pressure by a litre of sea-water should range, according to Professor Dittmar's experiments and calculations, from 8·18 c.c. in cold regions at 0°C. to 4·50 c.c. in the tropics, with a temperature of 30°C. The results experimentally obtained from samples of surface-water collected during the voyage differ considerably in detail from the calculated estimates from various causes explained, and especially because of the reduction of the amount of oxygen by oxidation and respiration. The main and almost sole source of the nitrogen and oxygen present in deep-sea water lies in the atmosphere and is aborbed there, its quantity being thus dependent on surface conditions of temperature and pressure and not those of the depths. A given quantity of water, having absorbed its oxygen and nitrogen at the surface, may be supposed to sink unmixed with surrounding water to the depths. During the process its amount of contained nitrogen remains constant, whilst its oxygen-supply becomes gradually diminished, owing to the process of oxidation, which in the depths go on without compensation. That the amount of absorbed oxygen present in sea-water diminishes with the depth had been shown already by Dr. Lant Carpenter's experiments. It is not yet possible to formulate in any precise terms the relation between the depths and the diminution of the oxygen present, but Mr. J. Y. Buchanan's previous conclusion that a minimum of oxygen is contained at a depth of about 800 fathoms is not confirmed by the summing up of the whole of the evidence now available. This result is not without biological significance, since the existence of this supposed zone with a minimum of oxygen has been used as an argument in favor of the occurrence of especially abundant life at this depth below the ocean surface.

Professor Dittmar finds that there is nothing characteristic

of bottom-waters, as such, in regard to their absorbed gases, nothing to distinguish them from waters from intermediate depths. This, it seems to me, is not quite what might have been expected, as the concentration of the food supply, and consequently of life, on the actual bottom might have led to a different result.

If there were absolute stagnation of the water at great depths the oxygen might be reduced there to zero, but the fact that in no case has oxygen been entirely absent from any sample of deep-sea water examined proves that a certain motion and change must occur. The smallest amount of oxygen found at all was in a sample of water from a depth of 2,875 fathoms, and amounted to 0·65 c.c. per litre only, a result long ago published by Mr. Buchanan. Even this, however, may well be sufficient to support life, since Humboldt and Provencal found that certain fish could breathe in water containing only one-third of that quantity of oxygen per litre. In another sample from 1,645 fathoms, it was 2·04 c.c. On the other hand, as much as 4·055 c.c. was found in a sample from 4,575 fathoms, and 4·39 c.c. in one from 3,025. Most remarkable, in one instance water from a depth of only 300 fathoms yielded only 1·65 c.c. of oxygen. Professor Dittmar admits that there was no lack of anomalous results, some, no doubt, due to some extent to imperfection in the apparatus employed in collecting the water.

In connection with the valuable investigations carried on in the "Travailleur" and the "Talisman" by Professor Milne Edwards and his associates, French physiologists have lately commenced researches on some of the problems of deep-sea life.

Experiments have been made by M. Regnard with a view of determining the effects of high pressures, corresponding with those of the deep sea, on various organisms. Yeast, after being exposed to a pressure of 1,000 atmospheres, equal to a depth of *about 6,500 fathoms of sea-water, for an hour, was mixed with* a solution of sugar. An hour elapsed before any signs of fer-

mentation appeared, and a mixture of yeast and sugar solution did not ferment at all whilst under a pressure of 600 atmospheres, equal to a depth of about 3,900 fathoms. Algæ, seeds of a phanerogamic plant, infusoria, and even mollusca and leeches, were found to be thrown into a sort of state of sleep or latency by exposure to similar pressures, recovering from this condition after a shorter or longer period of return to normal conditions. A fish without a swimming bladder, or one with the bladder emptied of air, may be submitted to a pressure of 100 atmospheres, equivalent to a depth of 650 fathoms, without injurious effect. At 200 atmospheres, equivalent to a depth of 1,300 fathoms, it becomes torpid, but soon revives when the pressure is removed. At 300 atmospheres, equivalent to a depth of about 2,000 fathoms, the fish dies.

These experiments are of the highest interest. The pressure made use of was obtained by means of water in the absence of air other than that absorbed at the normal atmosphere pressure, and thus the physical conditions produced were closely similar to those actually existent in the deep sea. They are the first of their kind.

Professor Paul Bert's somewhat similar experiments related to a different question altogether—namely, the effect on aquatic organisms of water subjected to the pressure of compressed air. He found that young eels were rapidly killed when subjected to a pressure of only 15 atmospheres, and could not survive one of even 7 atmospheres for any considerable time. He pointed out the essential difference between the conditions produced in such experiments and those existing in the deep sea, where the charge of oxygen contained by the water has been taken up at the surface under a pressure of one atmosphere only.

In the experiments on animals made by M. Regnard's method there is the obvious difficulty that the supply of oxygen in the water compressed cannot be renewed during the experiment, but must be gradually reduced by respiration, and for this reason it would probably be useless, unless a large quantity of

water would be employed, to try the effect on a fish of a very gradual application of pressure, extending over many hours. It is probable that the results would be greatly modified if plenty of time could be given for the fish to accommodate itself to the change of pressure, and the conditions in which it moves in nature slowly from one depth to another be imitated. The results of M. Regnard's further experiments will be looked forward to with great interest.

A question of the utmost moment, and one that has received a good deal of attention, is that as to the source of food of the deep-sea animals. Certainly a large proportion of this food is derived from the life on the ocean-surface. The débris of pelagic animals sinks slowly downwards, forming on its passage a sparsely scattered supply of food for any animals possibly living at intermediate depths, but becoming concentrated as it were on the bottom. The pelagic animals depend for their ultimate source of food, no doubt, largely on the various pelagic plants, the range of which in depth is limited by the penetration of sea-water by the sunlight, and probably to an important extent is dependent on the symbiotic combinations of radiolarians with zooxanthella. But a large part of their food-supply is also constituted by animal and vegetable débris derived from the coasts, either directly from the littoral zone or by rivers and the action of the tides from terrestial life. Immense quantities of shore-débris have been dredged from deep water near coasts, and deep-sea life appears to diminish in abundance as coasts are receded from. Unfortunately our knowledge of pelagic vegetable life is very imperfect, and it is to be hoped that botanists may be led to take up the subject and bring together what is known with regard to the geological ranges and abundance of the various larger seaweeds, trichodesmium, diatoms, and other algæ by which the sea-surface is inhabited. It will, then, be possible to form a nearer estimate of the extent to which these plants are capable of forming a sufficient ultimate food-source for the greater part of the pelagic fauna, and through it of deep-sea life. The question is of importance,

because if the deep sea, having no ultimate source of food in itself, derived its main supply from the coasts and land-surfaces in the early history of the habitation of the globe by animals, there can have existed scarcely any deep-sea fauna until the littoral and terrestrial faunas and floras had become well established.

Whether the littoral and terrestrial plants or the pelagic be proved to have the larger share in composing the ultimate food-source of the deep sea, it seems certain that the food as it reaches the deep sea is mostly in the form of dead matter, and I imagine that the long but slender backwardly directed teeth of many deep-sea fish, resembling those of snakes, are used rather as aids for swallowing whole other fishes which have fallen from above dead, and thus making the best of an occasional opportunity of a meal, than for catching and killing living prey. In a lecture on "Life in the Deep Sea," delivered in 1880, I suggested that putrefaction of organic matter, such as ordinarily occurs elsewhere, may possibly be entirely absent in the deep sea, the bacteria and other microphytes which cause it being possibly absent. Some interesting experiments with regard to this question have lately been made by M. A. Certes. He added to sterilized solutions of hay-extract, milk, broth, and other organic nutrient fluids mixed with sea-water, with the usual necessary precautions, small quantities of deep-sea mud, or deep-sea water, procured by the "Travailleur" and "Talisman." In some experiments air was present: others were made in vacuo. In nearly all the former putrefaction occurred after some time, especially after application of warmth, and micro-organisms were developed, whilst the latter remained without exception sterile, apparently indicating that the microbes which live where air is absent are not present in the deep sea. The others which developed in the presence of oxygen may possibly have sunk from the surface to the bottom, and have retained their vitality, although it is not improbable that they may be incapable of active existence and multiplication under the physical conditions there existing. M. Certes is

to make further experiments on this question under conditions of pressure and temperature as nearly resembling those of the deep sea as possible. In the deep sea the ordinary cycle of chemical changes of matter produced by life is incomplete, there being no plants to work up the decomposition products. These, therefore, in the absence of any rapid change of the deep-sea waters, must accumulate there, and can only be turned to account when they reach the surface-waters on the littoral regions.

Many interesting results may be expected to be obtained when the histology of animals from great depths comes to be worked out, and especially that of the special sense-organs. At present very little has been attempted in this direction, principally, no doubt, because deep-sea specimens are too precious to be used for the purpose. In a remarkable scopelid fish dredged by the "Challenger" from deep water, *Ipnops Murrayi* of Dr. Gunther, the eyes are curiously flattened out and occupy the whole upper surface of the mouth. They are devoid of any trace of lens or iris, and, as appears from observations by Mr. John Murray and my own examination of his preparations, the retina consists of a layer of long rods, with a very thin layer indeed of nerve-fibres in front of it, and apparently no intervening granular ganglionic or other layers. The rods are disposed in hexigonal bundles, the free ends of which rest on corresponding well-defined hexagonal areas, into which the choroid is divided. It is probable that aberrent structures may be found in the retinas of deep-sea fish, which may conceivably help towards physiological conclusions as to the functions of the various components. With regard to the all-important question of the nature of the light undoubtedly present in the deep sea, it is hardly possible to accept Professor Verril's recent startling suggestion that sunlight penetrates to the greatest depths, with perhaps an intensity at from 2,000 to 3,000 fathoms, equal to that of some of our partially moonlight nights. Such a conjecture is entirely at variance with the results of all experiments on the penetra-

tion of the sea-water by sunlight as yet made by physicists, results which have prevented other naturalists from adopting this solution of the problem.

The progress of research by experts on the deep-sea fauna confirms the conclusions early formed that it is impossible to determine any successive zones of depth in the deep-sea regions, characterized by the presence of special groups of animals. Within the deep sea region the contents of a trawl brought up from the bottom gave no evidence which can be relied on as to the depth at which the bottom lies within a range of at least 2,500 fathoms. Some groups of animals appear to be characteristic of water of considerable depth, but representatives of them struggle up into much shallower regions. Thus, of the remarkable order of Holothurian Elasipoda nearly all the representatives occur at very considerable depths, and their numbers diminish shorewards, but one has been found in only 100 fathoms. Again, the Pourtalesidæ range upwards into about 300 fathoms, and the Phormosomas, which Loven considers as eminently deep-sea forms, range up to a little over 100 fathoms depth, and are nearly represented in shallow water at a depth of only five fathoms by Asthenosoma. As has often been pointed out before, there are numerous genera, and even species, which range even from the shore region to great depths.

The fact that zones of depth cannot thus be determined adds seriously to the difficulties encountered in the attempt to determine approximately the depths at which geological deposits have been found. Dr. Theodore Fuchs, in an elaborate essay on all questions bearing on the subject, has attempted to determine what geological strata should be considered as of deep-sea formation, but, as he defines the deep-sea fauna as commencing at 100 fathoms and extending downwards to all depths, his results may be considered as merely determining whether certain deposits have been found in as great a depth as 100 fathoms or less, a result of little value as indicating the depths of ancient seas or the extent of upheaval or depression of their bottoms. Mr. John Murray has shown that the depths at

which modern deep-sea deposits have been formed can be approximately ascertained by the examination of their microscopical composition and the condition of preservation of the contained pelagic and other shells and spicules.

The most important question with regard to life in the ocean, at present insufficiently answered, is that as to the conditons with regard to life of the intermediate waters between the surface and the bottom. It is most necessary that further investigations should be made in extension of those carried out by Mr. Alexander Agassiz with similar apparatus—a net, or vessel, which can be let down to a certain depth, whilst completely closed, then opened, lowered for some distance, and again closed before it is drawn to the surface. The greatest uncertainty and difference of opinion exist as to whether the intermediate waters are inhabited at all by animals, and, if they are inhabited, to what extent; and these intermediate waters constitute by far the greatest part of the ocean. If we estimate roughly the depth of the surface-zone inhabited by an abundant pelagic fauna at 100 fathoms, and that of the zone inhabited by the bottom animals at 100 fathoms also, the average depth of the ocean being about 1,880 fathoms, it results that the intermediate waters, concerning the conditions of life in which we are at present in the utmost uncertainty, really represent more than eight-ninths of the bulk of the entire ocean. Great care should be exercised in drawing conclusions from the depths ascribed to animals in some of the memoirs in the official work on the "Challenger" expedition. The scientific staff of the expedition merely recorded on each bottle containing a specimen the depth from which the net in which the specimen was found had been drawn up. In many instances, from the nature of the specimen, it is impossible that it can have come from anywhere but the bottom, but in many others it is quite possible that a particular specimen may have entered the net at any intermediate depth, or close to the surface, and this is a matter on which the author of the monograph in which the specimen is described can form the best conclusion, if one can

be formed at all from his knowledge of the animal itself. In all doubtful cases the mere record of the depth must be received with caution.

Just as before the commencement of the present period of deep-sea research there was a strong tendency amongst naturalists, owing to the influence of the views of Edward Forbes, to refuse to accept the clearest evidences of the existence of star-fish and other animal life on the sea-bottom at great depths, so there seems now to have sprung up in certain quarters an opposite tendency, leading to the assignment of animals possibly of surface origin to great depths on inconclusive evidence.

With regard to the constitution of the deep-sea fauna, one of its most remarkable features is the general absence from it of Palæozoic forms, excepting so far as representatives of the Mollusca and Brachiopoda are concerned, and it is remarkable that amongst the deep-sea mollusca no representatives of the *Nautilidæ* and *Ammonitidæ*, so excessively abundant in ancient periods, occur, and that *Lingula*, the most ancient Brachiopod, should occur in shallow water only.

There are no representatives of the most characteristic of the Palæozoic corals, such as *Zaphrentis*, *Cystiphyllum*, *Stauria*, or *Goniophyllum*. Possible representatives of the *Cyathonanidæ* have indeed been obtained in *Gruyina*, described by Professor Martin Duncan, and *Haplophyllia* and *Duncania*, described by the late Count Pourtales, but the *Cyathonanidæ*, are the least observant and characteristic members of so-called *Ringosa*. Pourtales justly felt doubtful whether the arrangement of the septa in four systems instead of six could in itself be considered as a criterion of the *Rugosa*, and in the cases of *Haplophyllia* and *Duncania* the septa may be described rather as devoid of any definite numerical arrangement than exhibiting any tetrameral grouping. Further, I have lately examined by means of sections the structure of the soft parts of *Duncania* in a specimen kindly given me by Mr. Alex. Agassiz for the purpose, and find that with regard to the peculiar arrangement of the longitudinal septal muscles and the demar-

cation of the directive septa the coral agrees essentially with the henactinian *Caryophyllia* and all other modern *Madreporaria* the anatomy of which has been adequately investigated.

There are further no representatives of the ancient *Alcyonarians*, forming massive coralla, the *Helioporidæ* and their allies, in deep water, no *Palæocrinoids*, *Cystidea*, or *Blastoidea*, no *Palechinoidea*, no *Trilobites* no allies of *Limulus*, no *Ganoids*. Further, other ancestral forms, certainly of great antiquity, although unrecorded geologically, such as *Amphioxus*, do not occur in deep water. It might well have been expected that, had the deep sea been fully colonized in the Palæoxonic period, a considerable series of representative forms of that age might have survived there in the absence of most of the active physical agents of modification which characterize the coast regions.

From the result of present deep-sea research it appears that almost all modern littoral forms are capable of adapting themselves to the conditions of deep-sea life, and there is no reason why Palæozoic forms should not have done so if the abyssal conditions were similar to those now existing, just as a considerable number of forms of the chalk period have survived there. In fact, however, most of the survivals of very ancient forms—*Heliopora*, *Limulus*, *Amphioxus*, *Dipnoi* *Ganoids*—occur in shallow seas of fresh water.

With regard to the origin of the deep-sea fauna, there can be little doubt that it has been derived almost entirely from the littoral fauna, which also must have preceded, and possibly given rise to, the entire terrestrial fauna. Although the littoral, and even its offspring, the terrestrial faunas, have undoubtedly, during the progress of time, contributed to the pelagic fauna, and although it is very likely that first traces of life may have come into existence in the shallow waters of the coast, it is not improbable that we should look to the pelagic conditions of existence as those under which most of the earliest types of animal life were developed. Nearly all the present inhabitants of the littoral zone revert to the pelagic free-swim-

ming form of existence in their early developmental stages, or in cases where these stages have been lost can be shown to have once possessed it. And these pelagic larval forms are in many cases so closely alike in essential structure, though springing from parents allied but widely differentiated from one another in the adult form, that it is impossible to regard them as otherwise than ancestral. Had they been produced by independent modification of the early stages of the several adult forms as a means of aiding in the diffusion of the species, they must have become more widely differentiated from one another. The various early pelagic free-swimming forms, represented now mostly only by larvæ, gradually adapted themselves to coast life, and underwent various modifications to enable them to withstand the beating of the surf on the shores and the actual modifying alterations of the tides, which, together with other circumstances of coast life, acted as strong impulses to their further development and differentiation. Some developed hard shells and skeletons as protections; others secured their position by boring in the rocks or mud, others assumed an attached condition, and thus resisted the wash of the waves. A remarkable instance in point, about the circumstances of which there can be little doubt, is that of the *Cirripedia*. The *cypris* larva of *Balanus*, evidently of pelagic origin, sprung from a *Nauplius*, fixes itself by its head to the rocks and develops a hard conical shell, by means of which it withstands the surf in places where nothing else can live. In the same way the *Planula* larva, the Palæozoic cœlenturate form, produces the reef coral and various other forms specially modified for and by the conditions of littoral existence. Similarly echinoderms, mollusca, polyzoia, crustacea, recapitulate in their ontogeny their passage from a pelagic into a littoral form of existence.

It is because the ancestors of nearly all animals have passed through a littoral phase of existence, preceded mostly by a pelagic phase, that the investigations now being carried on on the coasts in marine laboratories throw floods of light on all the

fundamental problems of zoology. From the littoral fauna a gradual migration must have taken place into the deep sea, but probably this did not occur till the littoral fauna was very fully established and considerable pressure was brought to bear on it by the struggle for existence. Further, since a large share of the present food of deep-sea animals is derived from coast-débris, life must have become abundant in the littoral zone before there could have been a sufficient food-supply in the deeper regions adjoining it. Not until the development of terrestrial vegetation and animal life can the supply have reached its present abundance. Such a condition was, however, certainly reached in the Carboniferous period. From what has been stated as to the general absence of representatives of Palæozoic forms from the deep sea, it is just possible that if deep oceans existed in Palæozoic periods, they may *not* have been colonized at all, or to a very small extent, then, and that active migration into deep waters commenced in the secondary period. Very possibly the discharges of carbonic acid from the interior of the earth, which Professor Dittmar believes may have been sufficient to account for the vast existing deposits of coal and limestone, may have been much more abundant than at present over the deep-sea beds in the Palæozoic period, and have rendered the deep waters more or less uninhabitable.

In his splendid monograph on the *Pourtalesia*, which has recently appeared, Professor Loven has dwelt on the peculiar importance of the littoral region, and of the infinity of agencies present in it "competent to call into play the tendencies to vary which are embodied in each species." He treats of the origin of the deep-sea fauna from that of the littoral region. It is impossible here to follow him in his most valuable speculations. In one matter, however, I would venture to express a difference of opinion. He regards the littoral forms of invertebrates as migrating into the deep sea by the following process: Their free-swimming larvæ are supposed to be carried out by currents far from land, and then, having completed their development, to sink to the bottom, where a very few survive and thrive.

It is hardly to be conceived that any animal, especially in a young and tender condition, could suddenly adapt itself to the vast change of conditions entailed in a move from littoral to deep-sea life. It seems to me much more likely that the move of animals from the shallow to the deep sea has been of the most gradual kind and spread over long series of generations, which may have migrated downwards, perhaps a fathom or so in a century, partly by very slight migrations of the adults, partly by very short excursions of larvæ. Thus alone by almost insensible steps could animals, such as those under consideration, be enabled to survive an entire change of food, light, temperature, and surroundings.

A CANADIAN UNIVERSITY.

I HAVE read with great interest the appeal to the Alumni and friends of Victoria, in the November number of the V. P. JOURNAL. If we could only get this college question always dealt with in the spirit and with the ability of "An Anxious Alumnus," there would be little reason to fear the perpetration of fatal mistakes. In this humble contribution to the discussion, I claim only to be unconscious of prejudice, and to be chiefly desirous of aiding in the building up of a great Canadian—perhaps it would be more correct to say Ontarian—University. This cannot be done without money. The joint endowment of Toronto University and University College amounts to about three-quarters of a million, and the bulk of the revenue from this fund is absorbed by the College. The buildings provided for both bodies are also chiefly utilized by the College for purposes of tuition, and yet neither the accommodation nor the revenue is sufficient. In order to give adequate instruction in the university curriculum, even as it stands at present, the teaching staff should be doubled, and the curriculum itself should be greatly extended. The annual appropriation for the library is not enough to keep it up to the

requirements of the times, and the laboratories and museums are greatly in need of additions.

The obvious question is: if this is the condition of the Provincial University College, with its large endowment, how can colleges with less than one-fourth or one-fifth of its revenue be expected to keep up in the race? He who ignores the complete change in the situation which the past twenty years have brought about in America, is not in a position to discuss the university question intelligently or make any valuable contribution towards its solution. To talk of building up a great Methodist university on an endowment of a quarter of a million, even with adequate buildings thrown in, is absurd. The experience of Toronto University College proves this, and that of some of the great American universities is even more instructive. Twenty years ago the richest of them were hampered by want of revenue, and were doing no such work as is now being done at Johns Hopkins, Harvard, or Cornell. These, with Yale, Columbia, and Michigan, are all within easy reach of Canadian students, not a few of whom have already found their way southward in search of that higher training which is denied them in their own country.

To some this exodus may appear a matter of little moment. I confess that to me it assumes an entirely different aspect. Those who go to the United States to complete their university education will in many cases remove there, attracted by the wider field with its greater possibilities. If we are to have a country worthy of the name, and capable of a noble future, we can have it only by retaining within it the young men who are its chief hope; and who are they, if not those who appreciate an academic training so highly that they are willing to make great personal sacrifices in order to obtain it? Have we room in this Province for more than one university which shall be a rival to the great American universities? Are the people of Ontario able and willing to properly equip more than one? Have we more than enough of university students for one?

I would answer these questions with an emphatic negative.

I do not belittle the work done by all our universities in the past, and Victoria has done her share under very serious disadvantages. But the situation has changed, and we must change with it, or be left behind in the race. I do not pretend to see, much less to explain, precisely how consolidation and co-operation can be brought about, but I am sure that an earnest effort on the part of those who have to shape our university policy need not fail. Meantime let us have frank but friendly discussion of both the principles and details of possible schemes. In no other way can the best possible union be evolved, and—what is of still greater importance—in no other way can public opinion be educated up to the desired point. Concessions and compromises there must be on every side; let us know as soon as possible how much we are expected to concede, in order that we may settle, each for himself, just where he will be prepared to make a stand when the time comes for a final decision.

WM. HOUSTON.

TORONTO, Nov. 17th, 1884.

WEEDS.

BY REV. HUGH MACMILLAN, LONDON, ENG.

(Continued from page 234.)

THAT weeds belong to the most recent and specialized flora of the world is evident from their wide distribution and wonderful powers of colonization. In our own country they number about two hundred and thirty, and constitute about one-seventh part of our native flora. We are constantly receiving accessions from the continent, along with seeds of our cultivated plants. In common with the wheat and barley that can be cultivated in India down to the tropic zone, because they can be sown and reaped during the coldest quarter of the year, have been introduced a crowd of the common annual weeds of our country, such as the shepherd's purse, the chickweed, the spurge, and the corn-pimpernel, which also run

through the cycle of their lives in the winter season. Half the weeds of American agriculture have been imported from Europe; and of the 2,100 flowering plants of the Northern United States, 320 are European. Our thistles have become naturalized in North America to such an extent as to have become a perfect pest; while in South America they cover some parts of the pampas with thickets as high as a man on horseback, and more impervious than a tropical jungle. Our chickweed in New Zealand is fast exterminating the tough and woody native flax-plant; while our water-cress threatens to choke up altogether the still waters of New Zealand, where its stems often attain twelve feet in length and three-quarters of an inch in diameter. It is a singular circumstance that neither the southern nor the western hemisphere has reciprocated this evil to any great extent, notwithstanding the vast intercourse that exists between these regions and our country, and the large number of their plants which we have introduced into our gardens. Australia and New Zealand have sent us no weeds, and America only a very few. The solution of this mystery, as Dr. Seeman clearly proves, is not to be found in any consideration of climate, soil, or circumstance. It is a question of race. The present flora of the United States and of Australia is older than the Germanic flora which now constitute the principal vegetation of Europe. It is very similar too, if not absolutely identical with, that of Europe during the Miocene and Eocene periods. America and Australia have not yet arrived at the degree of floral development to which Europe has attained: consequently plants coming to our country from Australia and America would not come as colonists, with a new part to play in it, but as survivors of an older flora whose cycle of existence had ages ago run out there. Our system of the rotation of crops is based on the fact that the soil which has borne one kind of harvest will not produce the same next year, but requires another kind of crop to be grown on it. And nature in her wilds carefully observes the same law. The former geological flora of the country has exhausted

its capabilities in it, and returning at a later date from another country, finds in it no circumstances suitable for its growth and extension. On the other hand our plants going to Australia and America encounter there an older flora, which has survived since the Eocene and Miocene epochs, and is about to pass away in the altered conditions of the world. In the struggle for existence the older flora has no chance with the newer and better equipped flora coming for the first time in contact with a soil to it altogether virgin. The same stern law would appear to apply to the whole of organized nature. Man's own history furnishes some of the most remarkable examples of it. The native races associated with the peculiar flora of Australia and America are disappearing rapidly before the advance of the European; and it is not without reason that the Maori and the Red Indian view with dread the appearance of the plantain and the chickweed around their homes, for these are but the daring and hardy outposts of a vast invading army that will drive their native vegetation off the field, and the harbinger of a mighty people who will ultimately march over their graves to the occupation of all the land.

Whatever our weeds were in their original state, they are now like the corn which man sows in the same field with them, endowed with habits so long acquired that they will part with life sooner than abandon them. The original wild plant corn—if there ever was such a thing, and this admits of grave doubts—from which our corn was developed, may have been able to propagate and extend itself freely independent of man; but we know that without man's agency the corn as it is now modified would perish. It does not grow of its own accord, or by the natural dispersion and germination of the seed. Left to itself, it would quickly disappear and become extinct. The one condition of its permanency in the world, of its growth in quantities sufficient for man's food, is that it be sown by man in ground carefully prepared beforehand to receive it. The same rule would appear to hold good in regard to the weeds which, in spite of himself, he cultivates along with it, and whose per-

sistent presence makes the cultivation of the soil so difficult to him. We know them only in an artificial condition as abnormal forms of original wild types; and as such they are incapable of continuing themselves without man's help. Left to grow in soil that has reverted to its original wild condition, they would soon be overpowered by the surrounding vegetation, the grasses and the mosses, and in a shorter or longer time would inevitably disappear. I have seen many ruins of dwellings in upland glens from which the nettles and all the weeds that once grew in the field and garden plot have utterly vanished, leaving only a dense thicket of bracken, or a lovely smooth carpet of green sward, to indicate among the heather that man had once inhabited the place. We are bound, therefore, to believe that so long as man cultivates the soil, so long will these weeds make their appearance, and in striking co-relation with the primeval curse, compel him, in the sweat of his face to eat his bread. When he ceases to till the ground they will cease to grow in it.

Our weeds are distributed pretty widely over the different families of the vegetable kingdom. The poorest and meanest-looking of them claim kindred with some of the brightest flowers in this and foreign countries. Why do these homely weeds differ so widely from their splendid relatives? Whatever they might once have been in their wild condition, they have been placed in circumstances which have necessarily degraded them. Intruding upon the cherished domains of man, they have been treated uniformly as enemies, injured, extirpated, maimed, expelled in every possible way. For ages they have never had a chance of developing the latent beauty that may be in them. What loveliness those of them that are left long undisturbed display is shown by the buttercup, which makes an old meadow like a field of the cloth of gold; or the daisy, which transfigures every neglected pasture-land and makes it whiter with its snowy robe than any fuller on earth could whiten it! How much more beautiful are the scarlet poppy and the corn blue-bottle that are left to grow among the

corn-fields—for the same reason that the householder in the parable gave to the servants who would gather out the tares from the wheat, lest the wheat should be rooted up with them—than the sheep-sorrel and the groundsel, that are remorselessly hoed away from the cabbage-beds and potato-drills, whenever they make their appearance! How much more beautiful is the wild pansy that grows on the undisturbed upland pastures than its little field relative which grows on soil which is constantly up-turned, and whose flowers have, therefore, been reduced to the lowest point in respect of color and form! How much more striking is the large blue-eyed forget-me-not of the bogs than the species which grows in the field which man is constantly tilling! Our brighter weeds are invariably found in places where they are permitted to undergo these changes, by insect selection, which issue in richer and more varied loveliness still; whereas the homelier ones, standing directly in the way of the cultivation of the soil, are constantly harassed and prevented from putting forth their flowers, or taking advantage of those forces which regulate the wonderful floral beauty in the world. In their case, too, as in the human world, "the destruction of the poor is their poverty." And yet, among the weeds that have the least conspicuous flowers, how much loveliness may be detected by the cultivated eye that seeks for it! In these the blossom, mean as it is, is made the most of; and we see in the varied colors of the unopened and opened flowers of the common viper's bugloss, and in the pinkish bracts of the purple dead nettle, aspirations, as it were, on the part of these lowly plants towards a higher type of beauty.

But weeds, as weeds, will never develop much floral loveliness. Their *raison-d'être* is not to delight the eye of man, but to further his moral discipline. With the primeval curse of barrenness and weeds upon the earth are correlated the facts, that thorns are stunted or abortive forms of branches or of buds that in happier circumstances would have gone on to develop fruit and foliage, and that the downy parasols by

means of which the thistles spread in myriads are due to degeneration of floral parts; the very instruments of man's punishment, the very goads that prick him to exertion, being thus, like himself, failures on the part of nature to reach an ideal perfection, and thus witnesses to him in nature of his own degradation and of the imperfection of his life. The thorns and thistles of the wilderness without are faithful emblems of the thorns and thistles of unsatisfied desires and unfulfilled hopes in the waste ground of the heart within. Their singular association with him, unwelcome as it is, is thus not altogether an unmixed evil. For, just as labor, *the great curse of the world, has proved its greatest blessing*, developing out of its cares, and toils, and duties the highest civilization of man—as the thistle itself develops out of its prickly stem and foliage a rich purple blossom of beauty—so in the ever-renewed contest which man is obliged to wage with those persistent invaders of his fields and gardens, so that his table is literally furnished in the presence of his foes, he acquires habits of patience, perseverance, and steady industry, and learns lessons which, if he will only pay heed to them, will make him wise for this world and the next.—*In "Two Worlds are Ours."*

POWER OF THE MICROSCOPE.

LET me ask every gentleman here to look to-morrow morning at the unsharpened edge of his razor in order to form a distinct idea of what the one-thousandth part of an inch is. I suppose a thousand dull razor-edges put side by side might make an inch. Now, under our better present microscopes, how much breadth may such a razor's edge be made to appear to have? We can magnify the one-thousandth part of an inch to the breadth of three fingers, or, exactly speaking, to the length of that line (referring to colored diagrams exhibited on the platform). The one-thousandth part of an inch, or the dull edge of your razor magnified twenty-eight hundred times

linear, is as thick as your three fingers. When you have a dot only the one four-thousandth part of an inch in diameter, that is, a dot so small that four like it could lie abreast of each other on your razor's edge, and when you magnify that dot four thousand times it is precisely the size of this dot, or as large as an English shilling. We are going into a labyrinth, my friends; and I wish you to know what opportunities for exact observation the latest science furnishes. You will hear the assertion, that under the highest powers of the microscope, protoplasm or broplasm is apparently structureless. I beg you to look at your razor's edge, in order that when you examine broplasm with a power that magnifies twenty-eight hundred times in a linear direction, and know that a line the thousandth part of an inch thick under that power would be three fingers broad, you may be tolerably certain that, if there be any structure in the broplasm that carmine will stain, you will see it.—*Joseph Cooke's Biology.*

STOMACH-WASHING FOR DYSPEPSIA.

THE practice of treating patients suffering from chronic dyspepsia which resists the influence of regulated diet and of drugs, by washing out the stomach, which originated some years ago in Vienna, forms the subject of a paper by Dr. W. B. Platt, in the *Maryland Medical Reporter.* We are there informed that cases most intractable to all other treatments have quickly yielded to this means. The principle underlying the treatment is to keep the stomach clean, and, so far as possible, at rest for a time sufficient to allow of its complete recovery. The operation should be performed in the morning, before breakfast. A soft, red rubber tube is passed gently down into the stomach quite to the pylorus: with this is connected about a yard of common flexible tubing and a glass funnel, which is held on a level with the patient's breast, and tepid water is poured slowly into the funnel, until a sensation of fulness is experienced; the funnel is then depressed to the level of the

waist, and the fluid allowed to syphon out. The process is repeated until the water returns quite clear. The washing should be repeated every day for a week or ten days, and during that time the diet should be restricted to milk or a little meat; then the washing may be done every second or third day, and finally abandoned at the end of three weeks. The advantages claimed for this method are that it is efficacious, simple, and safe, and it certainly is worth a trial in intractable cases of chronic dyspepsia,—a disease which makes its victims a burden to themselves and their friends, and hitherto has brought but little credit to physicians.—*Canadian Scientific Monthly.*

THE HITTITES.

IN this age of discoveries the triumphs of Archæology and Philosophy keep pace with those of Physical Science. The last triumph is the disinterment of the Empire of the Hittites, a race associated in the Bible with the Amorites, the Perizzites, and the Jebusites, and as we have been used to think, their equal in obscurity, but now declared to have extended, reigned, and left monuments of its power from the Euphrates and the border of Egypt to the Ægean. The supposed evidences of this discovery are collected in a work just published by Dr. William Wright, with a decipherment of inscriptions by Professor Sayce, a Hittite map, and fac-similes of Hittite inscriptions. Dr. Williams asserts that his revelations prove the Bible true by contemporary and corroborative evidence, putting to the rout Dr. Francis Newman and all other skeptical critics of the Biblical references to the Hittites; and that the same memorials, being deciphered, confirm the Bible and bring to light a lost empire. The Hittites, it seems, contended for ascendancy with the kings of Egypt, the victory of one of whom over them has been celebrated by the Egyptian "Poet Laureate," a bard worthy of the royal patronage, since he has described the king, when deserted by his own charioteers, as

overthrowing single-handed two thousand five hundred chariots of the enemy. After enduring "longer than the Roman Empire," the empire of the Hittites was finally laid in the dust by Sargon the Assyrian at the fatal battle of Karchemish. Such is the story told according to Dr. Williams and his eminent coadjutors by the inscriptions on stones in conjunction with the Egyptian and Assyrian records. Of the stones Dr. Williams himself carried off the most important, with antiquarian rapture, from Hamah, before the face of an angry population which swarmed out to prevent the removal of the mysterious relics. At one moment a crisis, fearful to the soul of the antiquary, impended. "A greater calamity than that of the Moabite-stone tragedy was imminent. A mighty empire was about to claim its position among the great nations of the ancient world, and a few fanatics were about to push it back into the outer darkness to which history has assigned it." Hamah, or Hamath, on the Orontes in Upper Syria, has been hitherto supposed to have been a station of Phœnician commerce with the Syrians and Assyrians. This would connect it with the Semites. But the Hittites are pronounced to have been of a totally distinct stock from the Semites, and (on the evidence of their moccasin-like shoes) to have come down from the cold plateau of Anatolia. It must, however, be said, that if the two figures, of which an engraving is given from a drawing of Mr. Davis, are not those of Semites, there is no faith in noses. It is to a very shadowy existence as yet that, by antiquarian enthusiasm and the confidence of the decipherer in his occult art, the Hittite Empire has been recalled.—*The Week.*

ERRATUM.—In our November number, page 218, first paragraph, after the word "themselves," supply the *omitted* words, "of the advantages arising from a good preparatory course of professional training; and it is but just that those who merely desire to make the position a stepping-stone to some other calling be required also to fit themselves" for discharging, etc.

THE STONE.

HAVE you ever remarked an old gray stone lying on the sea-shore at flood-tide on a spring day; the throbbing waves washing around it, caressing it, fawning on it, and clinging to it, and crowning its moss-grown head with a dazzling, pearly shower of glittering foam! The stone remains ever the same, only its gloomy surface glitters with brighter hues. And these hues bear witness that once, in some bygone age, before the liquid granite had scarce begun to consolidate, it glowed throughout with fiery colors. So was it also with my aged heart, when, a short while since, youthful, feminine souls encircled it on every side; under their caressing touch the long-since faded colors sparkled afresh, and glowed with their former ardor. The waves floated back, . . . but the hues are not yet faded, though a piercing wind effaces them yet more and more.—*Ivan Turgenieff.*

CLAY BOOKS.

FAR away beyond the plains of Mesopotamia, on the banks of the river Tigris, lie the ruins of the ancient city of Nineveh. Not long since huge mounds of earth and stone marked the place where the palaces and walls of the proud capital of the great Assyrian empire stood. The spade, first of the Frenchman, then of the Englishman, has cleared all the earth away, and laid bare all that remains of the old streets and palaces where the princes of Assyria walked and lived. The gods they worshipped and the books they read have all been revealed to the sight of a wondering world. The most curious of all the curious things preserved in this wonderful manner are the clay books of Nineveh. The chief library of Nineveh was contained in the palace of Konyunjik. The clay books which it contains are composed of sets of tablets covered with very small writing. The tablets are oblong in shape, and

when several of them are used for one book, the first word of the tablet following was written at the end of the one preceding it. The writing on the tablets was, of course, done when the clay was soft, and then it was baked to harden it. Then each table or book was numbered and assigned to a place in the library with a corresponding number, so that the librarian could readily find it, just as our own librarians of to-day number the books we read. Among these books are to be found collections of hymns (to the gods), descriptions of animals and birds, stones, and vegetables, as well as history, travels, etc. The Assyrians and Babylonians were great students of astronomy. The method of telling time by the sun, and of marking it by the instrument called a sun-dial, was invented by the latter nation. None of our modern clocks and watches can be compared to the sun-dial in accuracy.—*Industrial News.*

A BEAUTIFUL OLD MAN.

BY far the most interesting figure present was the old Duke of Wellington, who appeared between twelve and one, and slowly glided through the rooms—truly a beautiful old man; I had never seen till now how beautiful, and what an expression of graceful simplicity, veracity, and nobleness is about the old hero when you see him close at hand. His very size had hitherto deceived him. He is a shortish, slightish figure, about five feet eight, of good breadth, however, and all muscle or bone. His legs, I think, must be the short part of him, for certainly on horseback I have always taken him to be tall. Eyes beautiful light blue, full of mild valor, with infinitely more faculty and geniality than I had fancied before; the face wholly gentle, wise, valiant, and venerable. The voice, too, as I again heard, is "aquiline" clear, perfectly equable—uncracked, that is—and perhaps almost musical, but essentially tenor or almost treble voice—eighty-two, I understand. He glided slowly along, slightly saluting this and that other, clear, clean,

fresh as this June evening itself, till the silver buckle of his stock vanished into the door of the next room, and I saw him no more. Except Dr. Chalmers, I have not for many years seen so beautiful an old man. . . . . Yesterday saw the Duke of Wellington's funeral procession from Bath House second-floor windows; a painful, miserable kind of thing to me and others of a serious turn of mind. The one true man of official men in England, or that I know of in Europe, concludes his long course. The military music sounded, and the tramp of feet and the roll of guns and coaches, to him inaudible for evermore. The regiment he first served in was there, various regiments or battalions, one soldier from every regiment of the British line; about 4,000 soldiers in all. Nothing else in the sumptuous procession was of the least dignity. The car or hearse, a monstrous bronze mass, which broke through the pavement in various places, its weight being seven or ten tons, was of all the objects I ever saw the abominably ugliest, or nearly so. An incoherent huddle of expensive palls, flags, sheets and gilt emblems, and cross-poles, more like one of the street carts that hawk door-mats than the bier of a hero. Disgust was general at this vile *ne plus ultra* of Cockneyism; but poor Wellington lay dead beneath it, faring dumb to his long home. All people stood in deep silence and reverently took off their hats. In one of the Queen's carriages sat a man conspicuously reading the morning newspaper. Tennyson's verses are naught, silence alone is respectable on such an occasion.—*From Froude's Life of Carlyle.*

TALENT is that which is in a man's power; genius is that in whose power a man is.—*Lowell.*

PARTY is the madness of the many for the gain of the few.—*Pope.*