

preparation to render it perfectly waterproof; and the whole boat can be taken apart and folded together in a space less than one-eighth of its original size, in about three minutes, and by the assistance of a couple of men only. When folded up it is perfectly flat, and can be transported on a sledge across the ice without the least difficulty. When open water is reached the order of things is exactly reversed—the boat is unpacked and spread out, and the sledge and its contents taken on board, dog team and all.

As to those who are going to be the principals in this adventurous and dangerous expedition, they are, all told, twenty-nine men. There is not a man among them whose qualities and character have not been well tested, from the captain down to the cook. The leader and commander-in-chief is of course Captain Hall; next in the command comes Capt. S. O. Buddington, of New London, an old whaling master of thirty years' experience, twenty-one of which were spent in the Davis Strait and Baffin's Bay. He is an old and trusted friend of Capt. Hall, who has implicit faith in his long experience and acknowledged ability. The second officer is Mr. H. C. Chester, also a whaling man, of twelve years' experience among the ice; and the third officer is Mr. Wm. Morton, who was Dr. Kane's trusted friend and companion, and is the only living mortal to whom it was ever permitted to look upon the open Polar Sea. He had the sad privilege to accompany Dr. Kane to Havana, and to bring his remains from there to Philadelphia for interment. Mr. Emil Schumann occupies the post of first engineer, and the scientific corps will consist of three gentlemen, one of whom, Dr. Emil Bissells, of Heidelberg, Germany, will attend the expedition as a surgeon naturalist. A student from the observatory at Ann Arbor, Mich., will probably be the astronomer; and an officer of the Signal Service Department will be aboard in the capacity of meteorologist. Beside these, there will be a blacksmith, carpenter, steward, and fourteen sailors, besides the Esquimaux interpreter, Joe, and his wife, Hannah. This latter interesting couple, with their little daughter, are genuine specimens of the Esquimaux, but having been in constant company with Captain Hall for eight years past, they speak very good English, and have acquired civilized manners. Joe is a famous hunter and "sealer," and his little wife is quite an accomplished woman in a "small" way, with considerable talent for languages and for music. Their little daughter, who will accompany them, is five years old, and has been for some time at school in Connecticut, where her parents have been lately residing, the guests of Capt. Buddington. They will join the ship at the Brooklyn Navy Yard, and a nice cosy little cabin has been fitted up for the exclusive use of them and their child. They are glad to visit once more their native fields of snow and ice; and it is not at all certain that they will again return with the expedition.

Although Capt. Hall expects to accomplish his purpose of penetrating into the great Polar Basin, if such an one really exists, and visiting the North Pole, in less than three years, the "Polaris" has been provisioned for four years, which can be extended to six with a little economy and judicious distribution of rations. The great staple of provisions is the so-called "pemmican," which is composed of three parts of selected dried meat to one part of the best suet, mixed with some other ingredients. The food is both nourishing and wholesome, and there is no danger of scurvy through the absence of salt—that pestilence of Arctic travellers—to be feared from its use. It is packed in 45 lb. tin cans, hermetically sealed, and of this there is no less than 10,000 pounds stowed away in the hold, the manufacture of which consumed and condensed 23,000 pounds of ordinary beef and 5,000 pounds of suet. Besides this, there is any quantity of dried and desiccated vegetables, such as potatoes, tomatoes, onions, etc., and a large stock of flour, biscuits, sugar, coffee, tea, condensed milk, canned fruits, and all other necessities for a protracted voyage. Capt. Hall, however, expects to be able to economize these provisions to a very considerable extent by substituting in their place the meat of the reindeer, musk ox, walrus, and other game of the regions he is about to explore. Everything has been done to make the quarters of both crew and officers as comfortable as the rather limited space would permit; and the between decks and cabins are perfect models of cleanliness. The state rooms, for the officers and scientist, are plain, but gotten up in good and convenient style, and the cabin aft is a perfect drawing-room in miniature. Handsome chromos decorate the walls, and a fine cabinet organ, a present to Capt. Hall from the Smith American Organ Manufacturing Company of Boston, promises cheer during the long Arctic night. A handsome carpet covers the floor, and there is an air of calm comfort about this little room.

#### THE LAST SIX MONTHS OF CHEMISTRY.

(From the Scientific American.)

In turning over the leaves of our last volume, to see what has been done in the line of chemistry, we do not come across the record of any startling discoveries, but we find a very satisfactory condition of things in the various laboratories of the world, and there is abundant proof of unusual industry among scientific men. It is pleasant to see that the ranks of scientific labourers have not been so largely thinned by death as they were a year ago. Very few men of distinction have been summoned away during the last six months, and the biographical sketches of these few have found suitable place in our columns. Conspicuous among those who have closed their labours may be mentioned Professor Wetherill, William von Haidinger, and Professor Stuedeler.

The efforts of chemists have been chiefly directed towards increasing our knowledge of the properties of substances previously discovered. This is in accordance with the humanitarian spirit of the age. The tendency now always is to make practical use of everything—in other words, to turn it to good account—and in this pursuit the chemists have been unusually successful since the commencement of the year. We can not occupy the time of our readers with a repetition of the accounts already given of the leading investigations, but it may be worth while to recall to mind a few improvements that have been made, in order to encourage original workers to make renewed exertions to round up and complete certain desired inventions.

A cheap method of making hydrogen was suggested by Du Motay, the same chemist who has enriched our knowledge of the manufacture of oxygen, which consists in heating slaked lime with some carbonaceous material. It looks like a cheap and easy way of procuring a gas that would have extensive application in the arts, if it were available in unlimited quantity.

When we have hydrogen in abundance, we can easily carburett it, and it would be a singular thing indeed if some day our illuminating gas were to be made out of water combined with slaked lime, and the distillation of coal were to be confined to the production of tar derivatives and aniline colours.

Our knowledge of hydrate of chloral has been much extended. A good deal of contradictory testimony exists in reference to it, and we are now going through the doubtful stage, in which the sceptical refuse to believe, and the credulous are much disturbed in mind. We have taken pains to give both sides a fair hearing, and the summing up of the evidence leads us to think that as a hypnotic the hydrate of chloral is one of our most useful remedies; but it ought never to be applied without the knowledge and consent of the best medical authority. The employment of chloral as a reducing agent, in many chemical processes, is novel, and bids fair to become a very important one. The incidental products growing out of its manufacture on a large scale have also found a use in the dye vat, so that our knowledge of this subject has decidedly increased during the past six months.

The increasing demand for albumen has occasioned more than the usual activity in the search for new sources of supply. While merchantmen look to far off islands, frequented by wild birds, the chemist examines home products, and finds in the blood a supply of albumen, that ought to be better economized and more largely used than it has hitherto been. Blood albumen is becoming a large article of manufacture, and some specimens we have seen are but little inferior to the best product of the egg. The sugar refiner, the photographer, the calico and aniline printer, consume large quantities, hence the attention bestowed upon this branch of industrial chemistry.

Beet sugar and grape sugar, two industries of the first importance, have received extraordinary attention of late, and they are likely to develop into sources of wealth to those who enter upon them with adequate knowledge and proper caution. In a country where corn is grown in such enormous quantity as on the prairies of the West, grape sugar made from starch ought to become an article of export. Its uses in the arts have increased wonderfully, and the demand for it is likely to advance just in proportion as a popular knowledge of its value is further disseminated. Beet sugar is undergoing experimental examination, as we have shown, and bids fair to assume importance in this country as well as in Europe.

The artificial production of cold by chemical means has been considerably studied, and we have published all that has been made known on the subject. The most successful agent thus far appears to be ammonia; and it is peculiarly fortunate that this chemical product can now be obtained very cheaply and in large quantities. Ammonia, as a motive power and as a refrigerating agent, can justly claim the attention of all experts. It is only a few years since the first organic compound was made by artificial means. The announcement of the discovery was everywhere greeted with profound attention, as the thought was near that at some future time we should be able by synthesis to make such rare and valuable medicines as quinine, morphine, codeine, and narcotine. Within a few months we have been able to give an account of the artificial production of coniine, one of the alkaloids, and this discovery offers encouragement that we are making progress towards the grand result indicated above.

The use of chlorine gas in metallurgical operations, although suggested some years since, has recently been brought more prominently before the public in connection with the toughening and refining of gold. As the production of chlorine gas can now be economically accomplished on a large scale, more particularly by Deacon's process, the attention of chemists is more than ever directed towards it, and there appears to be little doubt that it will obtain extensive use in the separation of many metals. The rare elements, silicon and aluminum, are more readily obtained from chlorine compounds than in any other way, and it is probable that gold will hereafter be refined by the use of this gas.

The applications of glycerine have gone on increasing, and especially for nitro-glycerine and dynamite we note for it an unusual demand. The chemical nature of glycerine, its boiling point, its solvent properties, and the temperature of its distillation, have been made the special subjects of inquiry during the present year, and much progress has been made.

Another chemical product, called carbolic acid, has been subjected to numerous experiments until it has become an important article of commerce.

From this hasty summary, it will be apparent that chemists have not been idle, but have contributed a fair share to our general stock of useful knowledge.

#### MANUFACTURE OF SPRING KNIVES

Few people, says the *Mechanics' Magazine*, have any idea through what a number of hands their pocket knives have passed in the process of manufacture. A bar of steel destined to furnish a number of blades is heated to redness. A length is cut off, and the forger speedily "moods" this, that is, shapes it roughly into the form of a pocket knife blade. Another heating is then required to fit the end for being fashioned into the tang, and yet another before it can undergo the further operation of "smithing," the last stage of which is the stamping of the mark of the thumb nail to facilitate opening. The tang is then ground, and the blade marked with the name of the firm. The slight bulge on the reverse side caused by this operation is removed by fire or the grindstone. The blade is then hardened by heating it to redness and then plunging it into water up to the tang. The tempering process follows next, the bluish-yellow tint being considered as indicating that the proper degree of heat at which to immerse the blade once more in cold water has been attained. After this the various kinds of blades are classified in the warehouse, and undergo sundry grinding operations to fit them for being hafted. Twelve distinct processes have by this time been gone through, and many more are necessary before the knife is completely finished, although the number of hands which it has now to pass through depends in a great measure on the finish to be given to the handle, according to the quality of the blades with which it is fitted, and the price which the completed article is intended to realize.

An eminent physician declares that spiritualism is a disease, and can be cured by tincture of iron and strychnine.

The Pope completed the 25th year of his pontificate on the 16th ult., the anniversary of his election, or on the 21st, the anniversary of his enthronement. The latter date was generally celebrated in the Catholic churches. His Holiness, who completed his 80th year on the 13th May, states that his official age takes two years off, from a mistake made in copying his baptismal register, when he was consecrated bishop.

The other day, says the *Kingston News*, the steamer "Europe" passed this port from Chicago. She had on board a large number of chests of tea for Liverpool, fifty days from Hong Kong via San Francisco and the Pacific Railway to Chicago. The cargo will arrive in Montreal in two days, and will thence at once be shipped for England on board one of the Allan line of steamers, and will probably reach Liverpool in time to have completed the entire distance from China to England in two months. This is the beginning of an important future for the St. Lawrence.

ROYALTY VS. REPUBLICAN.—The Rochester *Democrat* gets off the following hard hit at a certain class of American "society." The Marquis of Lorne married the Princess Louise only the other day, and the telegraph informs us that the pair have already reached home from their honey-moon trip. What kind of a royal wedding is this? The Princess Amelia—whose other name was Tweed—was united to the object of her heart a few nights since, at a cost of \$700,000; and it is not at all likely that she will return from her tour under six months. This is the difference between American and European royalty. We invite a comparison, perfectly satisfied as to the result. The Guelphs are very respectable, judging them by their past, but the glorious present and all independent progress embrace the Tweeds and the Maginnises. We remark boldly, let perfidious Albion put this in her pipe and smoke it.

Apologies of the mistake made by a contemporary in reporting Sir Wilfrid Lawson's speech, thereby debiting him with anathematizing the Irish, instead of saying "Glasgow" Irish, Lord Brougham was fond of telling a similar story. A bishop, at one of his country visitations, complained that the church was badly kept, and in bad repair, pointing out that the rain evidently came through the roof, and adding, with some warmth, an expression which he was horrified at finding in the local paper next day reported thus:—"I shall not visit this d—d old church again till it is in better order." The bishop's secretary thereupon wrote mildly suggesting that what his lordship said was, that he would not visit "this damp old church again." But the editor, in a foot-note, said that while gladly giving publicity to the explanation, he had every confidence in the accuracy of his reporter.

The arms of Sir John Herschel deserve a notice at the present moment. The first astronomer of the name, Sir William, was a German oboe player in the king's private band. He received encouragement from his royal master in the prosecution of the astronomical studies to which he had devoted his leisure, and eventually discovered the uttermost planet but one yet known in the solar system. He named it after his patron "Georgium Sidus," and was knighted and a coat of arms granted to him, which not only celebrated his discovery but also embalmed on the shield the instrument with which it was made. These arms were granted as an honour to the astronomer, and a disgrace to the so-called science of heraldry, which is worthy of better things:—"Argent on a mount vert, a forty-feet reflecting telescope with its apparatus, proper, on a chief, azure, the astronomical symbol of *Georgium Sidus* irradiated, or; crest, a demi-terrestrial globe, on which an eagle is standing with his wings elevated, or; motto, *Cælis exploratis*."

PROLONGED VIGILS.—Leibnitz sometimes passed three consecutive days and nights in the same chair, resolving a problem that interested him; an excellent custom, as Fontenelle observes, to accomplish a labour, but a very unhealthy one. The Abbé de la Caille, a famous astronomer, had a fork invented in which he adjusted his head, and in this position passed the night in astronomical observations, without knowing any other enemies than sleep and the clouds, without suspecting that there could be any more delightful way of employing these silent hours which revealed to him the harmony of the universe. Thus he contracted an inflammation of the lungs which carried him off in a short time. Girsdet did not like to labour during the day. Seized in the middle of the night by a fever of inspiration, he arose, lit the chandelier suspended in his studio, placed upon his head an enormous hat covered with candles, and in this strange costume he painted for hours. No one ever had a feebler constitution, or a more disordered state of health than Girsdet.

PREACHING TO A FLOCK OF SHEEP.—"Not one hundred miles from Dubbo," writes the correspondent of the *Sydney Empire*, "on an excellent sheep station, there is an intelligent, pious old man, who rounds up his sheep in the bush every Sunday, opens his Bible, and after giving out a text preaches a sermon to his sheep, which sometimes occupies half-an-hour in delivery. I am credibly informed that his flock of sheep has become so accustomed to be preached to once a week that on Sunday they seldom attempt to travel farther than the preaching-ground until their pastor has sermonised them. He usually gets on the familiar stump which serves as a pulpit, and if the preacher were not in earnest the apparently attentive looks bestowed upon him by some of the old ewes would often relax his stern features from sadness to extreme mirth. All the sheep face him, the dog lying by his side. With the Bible in one hand the preacher hammers away with the other, his stentorian voice being heard a mile off. Though his gesticulations are sometimes violent, yet the sheep look, and forbear to nibble the most enticing blade of grass until the benediction has been pronounced; after which they turn right about face, and disperse themselves over the plain or in the salt bush scrub. Meanwhile the old shepherd partakes of his primitive breakfast, and then pursues his monotonous vocation by following them."

Some one ambitious of doing a new thing has produced a wedding card with the lady's maiden name ruled through, above her marriage name. We presume this is to signify that she has come under rule.

#### TO CORRESPONDENTS.

S.—Sketch received. Not of sufficient general interest to warrant our producing it.