

cular, the following simple experiments are presented: Take circular discs of leather, say three or four inches in diameter, with a knotted string secured in its centre, and, when well water-soaked, press it upon any level wetted surface. The boys call this apparatus a "sucker," and it well illustrates the phenomenon of atmospheric pressure, or "suction," as it is usually called. If an effort be made to draw it away from this surface by the string, it will be found resisting very forcibly, but the gentlest pressure will slide it on the wetted surface. It does not offer the slightest opposition to motion in the direction of its face, nor will it resist removal if raised first at the edge and then peeled off. The atmosphere does not press two bodies together when it can get between them. It is only when excluded by a tight joint that the development of its pressure is possible; and it becomes sensible only when an effort is made to separate them by a force acting at right angles to the plane of their faces. Another simple experiment shows that when two level, smooth and clean surfaces come together, by a motion like the closing of a book—which is similar to that of a belt coming in contact with its pulley—there will be retained, between the two, a thin film of air; and while this remains, the contact of the two is imperfect, and the sliding of one over the other is easily performed. Take two iron "surface-plates" which have been scraped down to a practically perfect plane and lay one of these on the other like a belt goes on to a pulley. They will be found not in contact at all, but as if floating one on the other, and the top one will slide off by its own weight at the least inclination of the lower one. Much of this interposed film of air can be displaced by a sliding of one plate on the other, starting, say at one corner, with the plates in close contact, and carefully pushing one over the other, holding it the while close to, as if to keep the air out. Then, indeed, an obstinate resistance to sliding will be felt, and the friction of nearer contact will be made thoroughly sensible. But this way of bringing surfaces into contact has nothing to do with belt action, except to prove the need of plastic surface on belt and pulley, which will enable them to adhere, while in contact, with sufficient force to prevent sliding, and at the same time be uninfluenced by the intermedium of air. And, lastly, in order to put the matter to actual test, an apparatus was constructed, such that a leather belt was made to slide on the face of a smooth iron pulley, and also to drive the same iron pulley up to slipping off the belt. In both cases, the adhesion or driving power of the belt was held by a spring balance, so the work of the belt could be observed. Experiments were tried with this mechanism placed in a bell glass jar on the air-pump plate, with and without air in the jar, and if any difference was observed in the adhesion of the belt to the pulley, it had more in vacuum than when the atmosphere was present."

THE PERIL OF A MINER.

One of those thrilling episodes that occasionally enter into the life of a miner and illustrate its perils, occurred recently in the Wallace and Ferguson mine at Sheep Ranch. The shaft has two compartments, and is 400 ft. deep. Both compartments are used for hoisting purposes, signal bells being utilized to enable the engineer to distinguish between the divisions of the shaft. One day last week three men went down in the bucket, their destination being the 200 level. One of the trio, Thomas Taggart, got into the bucket, while the other two stood on its top and held on by the cable—the "usual way." Arriving at the 200-ft. station the men stepped off into the level, and Taggart had got partly out of the bucket when the bell in the other compartment gave the signal to hoist. The engineer mistook the signal and hoisted in the compartment in which the men had just gone down. Taggart was in the act of getting out of the bucket—had one leg out and one in, in fact—when the latter started up the shaft. The bucket, with Taggart hanging to it, had proceeded but a few feet when it tipped over, precipitating the unfortunate man headlong down the shaft. At the moment of falling—in utter desperation, as a drowning man grasps at a straw—Taggart caught at the rocky wall of the shaft with his hands. By a miracle of good fortune, one of his wrists lodged in a wedge-shaped interstice in the side of the shaft, and Taggart hung by one arm, suspended in mid-air with 200 ft. of space beneath him. No one can have the faintest conception of the unutterable horror of such a position. Enveloped in impenetrable darkness, suspended by one arm over an abyss that invited him to certain death if his frail support should give away, and alive to the knowledge that the descending bucket might precipitate such a catastrophe, Taggart's situation was so inexpressibly horrible that its contemplation makes one shudder. Luckily, however, his comrades

comprehended the situation of affairs, and by acting promptly prevented a tragic ending of the accident. Taggart was released from his perilous position, escaping any more serious injury than a severe strain of his physical system and mental faculties.—*Calaveras Chronicle.*

SALVES AND PLASTERS.

The tinsmith or plumber who goes through a year's work at his trade without a severe cut or burn is fortunate, but he considers himself equally fortunate if, in the case of a severe injury, he escapes from the dangers of salves and plasters. In regard to their injurious effects upon the skin, Dr. Van der Werde, whose skill in medicine is quite equal to his knowledge of science, says:

"Plasters and salves are more dangerous even than oil silk or rubber overshoes, as they are usually applied to wounds and sores, and in many cases produce more harm, than they do good, as they usually protract the cure, and often prevent it entirely. The cause is simply that plasters and salves are mostly water-proof, and therefore interfere with the natural function of the skin; if either of them is placed on a sound portion of the skin; and kept there for a few days the skin becomes sore. Their application is often the cause of the difficulty in healing wounds. Scores of cases have come under our notice where our advice to dispense with the use of so-called healing salves caused a finger which had been sore for months and kept sore by the continual application of different kinds of salves, to heal rapidly as soon as the use of salves was discontinued.

"It is the same with plasters; we have seen it over and over again, that a cut wound which had been covered with a plaster to shut off the air, as a foolish prejudice teaches, had a most protracted and painful course, while a similar wound, simply treated by bringing the edges together and covered with a piece of linen to keep it clean, healed in a few days. This keeping clean does not only mean to keep off dust and foreign substances, but to clean off the dried blood which may cover the cut. It is even often advisable to put some blood over the edges of the wound after they have been brought together with a few stitches or narrow cross strips of plaster, which, however, must never be allowed to cover the wound. It should not be lost sight of that the skin is made for contact with the air, and that this contact is necessary, not only to keep the skin in healthy condition, but also when repairs are going on; therefore no water-proof plaster should interfere. But blood is soluble in water and absorbs air, and it has a great healing power; in fact, there is no healing salve so efficient as the blood which often covers a wound, and which, therefore, must not be interfered with, by any means.

Under a dried crust of the blood repair goes on actively, as blood contains all the elements required for such repair, and renewal of tissues wants the nourishing ingredients which are found in the blood.

From long experience of both methods of treatment, we can heartily indorse all that the doctor says. We have frequently treated severe burns by pasting a sheet of white tissue paper over them, using pure gum-Arabic freshly dissolved in water. The object of having the gum fresh was to make sure that it had not soured or fermented. Burns which have begun to fester from the use of oils or ointments will frequently yield at once to such treatment, the swelling and inflammation quickly subsiding, healing beginning and the pain ceasing.

Is It So?—A foreign scientific journal remarks, as a curious physiological fact, that although open-air life is so favorable to health, yet it has the apparent effect of stunting the growth in early youth. Thus, while the children of well-to-do parents, carefully housed and tended, are found to be taller for their age than the children of the poor, they are not so strong in after years; the laborer's children, for instance, who play in the lonely country roads and fields all day, whose parents lock their humble doors when leaving for work in the morning, so that their offspring shall not gain entrance and do mischief, are almost invariably short for their age; the children of working farmers exhibit the same peculiarity. After sixteen or eighteen—after years of hesitation, as it were—the lads shoot up, and become great hulking, broad fellows, possessed of immense strength. According to these statements, it would seem that in-door life forces growth at the wrong period, and thus injures. Is it so?

ALUM and plaster of Paris, well mixed in water and used in the liquid state, form a hard composition and also a useful cement.