# SCIENCE NEWS

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## THE WEST INDIAN VOLCANOES

PELÉE, whose renewed activity is causing anxiety in Martinique, and Soufrière, which is showing signs of sympathetic eruption on the neighboring island of St. Vincent in the West Indies, are only two outlets in a complex of volcanic activity that really embraces the whole curving chain of islands known as the Lesser Antilles. This archipelago is really a semi-submerged mountain chain that is still lifting itself upward from the ocean floor, with great submarine valleys plunging precipitously off their sides. And wherever mountain chains are actively in the making, volcanoes may be expected.

The last known eruption of any volcano in these islands, according to Dr. Henry S. Washington, of the geophysical laboratory of the Carnegie Institution of Washington, was the disastrous explosion of Pelée in 1902, which was accompanied by a less destructive outbreak on the part of Soufrière of St. Vincent. In 1907 there was an ash-fall reported by some 20 villages in the islands, but its source could not be traced. It may have come from a submarine eruption.

Submarine eruptions are probably not uncommon phenomena in the Lesser Antilles, although in the nature of things they can not be as accurately observed as those of known volcanoes. Almost a century ago, in 1837, the French brig *Le César* reported sighting a tremendous fire, that seemed to spread over the whole heavens; it lasted for four hours. The sudden tidal waves that sometimes visit this portion of the ocean are believed to be due at least in part to submarine volcanic eruptions.

After its eruption in 1902, Pelée began to build up a most notable volcanic plug or spine, which rose 500 feet above its crater rim and emphasized the bareness of the summit that has given the volcano its name. "Pelée" in French means "bald." After slowly squeezing upward for several years, this pinnacle of lava fell to pieces. Soufrière, on St. Vincent, is one of three West Indian volcanoes bearing the same name. This arises from the common circumstances that many volcanoes yield sulphur; in French "soufrière" means merely a place where sulphur may be found.

## A TRANS-ATLANTIC TELEPHONE CABLE

EARLY in the year 1932, it will probably be possible to talk from the United States to Europe by telephone regardless of the static and atmospheric conditions that interfere with trans-Atlantic radio at times. By then it is expected that a trans-Atlantic telephone cable will be in use, providing an all wire voice circuit between the two continents.

Engineers at the Bell Telephone Laboratories are now working on the development of the cable system, which will connect New York with London. Long distance lines will radiate from each of these cities to the other parts of Europe and America. It is not expected that the cable will replace the present radio system, but its greater reliability will assure a connection at all times. It will also provide an additional channel so that more messages can be handled at once. The telephone cable will only handle one conversation at a time.

Recently developed alloys of nickel, cobalt and iron make telephony by cable possible. This metal is known as "perminvar." It is not used to carry the currents that traverse the cable, but is wrapped spirally around the cable as loading. A copper wire in the center is the actual conductor.

With a plain copper wire, which was used in the first cables, the wire and the sea outside acted as a condenser, even though the wire was fully insulated. Electricity is stored in a condenser something like water in a tank, so it is sluggish in its action. The condenser, which is the entire cable, must be charged before the operator at the other end gets a signal, while it must be discharged before another signal can be sent. This made early cable transmission very slow.

This capacity of the cable—the property that makes it a condenser—can be overcome by loading it. This is done by wrapping it with wire or tape made of metal which becomes magnetized by the slight currents flowing through the cable. For use in telegraphy, the Bell Laboratories developed an alloy called "permalloy," which is now in use on several high speed cables. These cables respond instantly to signals from the transmitting end.

Perminvar has a further advantage over permalloy, however, for it is affected the same extent by the same variation in current, whether in a weak current or a relatively heavy one. With telegraph cables, the current either flows or does not flow, and the change is from on to off so this property is not needed. Telephony, however, requires a wide range of current strength, to take care of the modulations of the voice. With a cable loaded with perminvar, this is possible.

The route of the new cable has not yet been definitely determined. Probably, the submarine part will be from Newfoundland to Ireland, a length of about 2,100 miles. From Newfoundland, the circuit will be carried through several other cable sections to Nova Scotia and thence over land wires to New York. From the Irish end, a submarine cable will carry it across the Irish Channel to Scotland, and then land wires will take it to London.

## THE ECONOMIC VALUE OF SKYSCRAPERS

ON a piece of city realty, with the land worth $200 per square foot, a 63-story building will yield the greatest return on the investment. With the land worth $400 a square foot, which is more nearly the value of land in the Grand Central Terminal region, a 75-story building will pay best. The engineering difficulties of a building as high as 2,000 feet, or nearly 200 stories, could be overcome, but such a structure would not be economically feasible. Even a building of 131 stories would not return any net income.

These are some of the principal conclusions drawn from a study that has been in progress during the last two years, under the direction of W. C. Clark, New York economist, for the American Institute of Steel Construction. Many arguments have been advanced on both sides of the skyscraper question, but the institute recognized that the decisive one would ultimately be whether or not the tall building is more profitable than the low one.

For the purposes of the study, the committee considered a specific site in New York near the Grand Central Terminal, on which the Lincoln Building, of 52 stories, is now being erected. Plans were actually drawn for eight separate buildings on this location, ranging from 8 to 75 stories. These were of the setback type, required for high buildings by the New York zoning laws. Estimates of costs and incomes were made for each of these by experienced architects, engineers, builders, building managers and rental agents.

The eight-story building, they found, would cost $22,193,000 to build, and would yield but 4.22 per cent. on the investment, at a land value of $200 per square foot. The 63-story building, costing $39,100,000, would give a return of 10.25 per cent. For higher buildings, the return decreases, becoming 10.06 per cent. for a 75-story building. Estimates made of returns on still higher buildings indicated that at 131 stories the net income would vanish. For higher land values, however, higher buildings are more economical. At $400 per square foot, the committee found, the 75-story building would give the greatest return.

From an engineering standpoint, Mr. Clark stated, buildings could be built up to 2,000 feet. This limit is imposed chiefly by the elevators, as the weight of the cables would become too large for greater altitudes. Also, he said, the normal human ear drum can not stand an elevator speed greater than 1,500 feet per minute. This speed would have to be attained for practical operation in a building of this size.

At present, the Woolworth Building in New York, 792 feet, or 58 stories, is the world's tallest. The Chrysler Building, now under construction, will reach 808 feet with its 63 stories. The Chicago Tower, now contemplated, may ascend to 880 feet, with 75 stories.

## THE CULTIVATION OF SUGAR BEETS

SUGAR beets, mangolds and other root crops whose tendency to go to seed too early is as troublesome to the planter as broody hens are to the poultryman who wants eggs have been cured of their habit by the paradoxical method of encouraging them in it. This has been disclosed by a study of the experiments of the late William Bateson, director of the John Innes Horticultural Institution and one of the world's leading students of genetics and evolution.

Sir A. D. Hall, present director, explains that the tendency of beets and similar crops to produce seed during the first year's growth is an expensive waste, for every beet that does it is lost so far as sugar-making or cattle-feeding is concerned. This habit is called "bolting." Sometimes five per cent. or even more of a field of beets will prove bolters.

The cure consisted in exposing prospective seed beets to extreme temptation to bolt, and then selecting the stable individuals that were able to withstand the impulse as the progenitors of the next seed generation. Seeds from the commercial strain to be experimented upon were sown under glass in December or January and the seedlings were planted out about the middle of April, when another lot of the same seed was sown in the open. Most of the planted out seedlings would bolt but the few which did not would be stored and planted out the following season to produce seed.

The results for Golden Tankard mangold are typical. From seed sown under glass in December, 1915, 25 plants were obtained, of which eight were non-bolters. Their seed did not bolt when sown in January, 1918, nor again in the next generation. Even so this seed was still not entirely freed from bolters, for when it was tried out more severely still, *i.e.*, sown December 20, 1920, when a year old, it yielded 7 bolters from 737 plants. After this further selection three generations gave no bolters from January sowings, nor any naturally in the open.

Sugar beet was not so readily freed from bolters. A particular strain at the outset gave 70 per cent. bolters under forcing, 63 in the next generation, and 71 per cent. in the second. In the third generation, however, no bolters were obtained from a total of 326 plants.

## RED CLOVER

THE definite strains of short-headed red clover blossoms which are becoming established are the result of the gradual disappearance of bumble bees in sections of the country which have become intensely agricultural and the taking over of their task by the shorter-tongued honey bees, according to Harry F. Dietz in a recent publication on "Pollination and the Honey Bee" issued by the Indiana Department of Conservation.

The long nectar tube of the red clover has heretofore made it practically dependent on the bumble bee for fertilization. Bee-keepers have looked with longing at the amount of potential honey available in the red clover, but it was impossible to breed a type of honey bee which had a tongue long enough to reach the treasure. With the bumble bees going, red clover as a seed crop seemed doomed.

However, as the yield of clover seed lessened each year, a greater per cent. of this smaller amount came from the occasional shorter tubed red clover blooms which short-tongued insects had been able to fertilize. As seed from these short-corolla flowers generally produced plants in their turn having the same kind of blossoms, the tendency was to produce a type of blossom which the honey bee can work. Though slow at first, the change has been hastened and the increasing yield of clover seen in the vicinity of apiaries seems to indicate that the red clover will eventually turn all its mating problems over to the honey bee.

## A NEW REMEDY FOR ANEMIA

DRIED stomachs of hogs are soon to vie with livers as the saviors of sufferers from pernicious anemia. This newest anemia remedy, made from one of the few unused

parts of hogs, has just been developed and announced by Drs. Cyrus C. Sturgis and Raphael Isaacs, of the Simpson Memorial Institute for Medical Research of the University of Michigan, and Dr. Elwood A. Sharp, of the Department of Experimental Medicine of Parke, Davis and Co. An ounce of extract from the dried, ground stomachs of hogs is as effective a remedy in pernicious anemia as a pound of raw liver or three ounces of the most concentrated liver extract yet made.

This is the latest step in the conquest of a disease, pernicious anemia, which a few years ago was in the category of the unvanquished ills of mankind. In 1926 it was found that by feeding liver to anemia patients their red blood corpuscles could be increased. Liver, once the poor man's meat, increased in price rapidly. Then the active principle in liver was extracted so that anemia patients could take small doses of the extract instead of eating large quantities of the liver itself. Now comes the new and cheaper source of the anti-anemia principle.

The new extract from hog stomach is not yet commercially available. But it will be far cheaper than liver or the costly liver extracts on which pernicious anemia patients until now have been dependent. Hogs' stomachs are largely a waste product, finding only slight use in the production of pepsin. The dried extract is practically tasteless and looks something like sawdust particles. Beef stomach and ox stomach are sold as tripe, which is a familiar food to many. Hog stomach, which has a different structure, is ground and dried to make the new extract. An immediate increase in the number of red blood cells took place when this dried hog's stomach was fed to patients suffering from pernicious anemia. The increase was even greater than that following liver treatment.

The new remedy for pernicious anemia was partly inspired by the work of a British scientist, Dr. W. B. Castle. In pernicious anemia the red blood cells fail to mature properly. Dr. Castle demonstrated that the stomach of normal persons secretes a substance which could develop a blood-maturing principle from meat. Consideration of this led the University of Michigan scientists, Drs. Cyrus C. Sturgis and Raphael Isaacs, to test the effect of stomach tissue itself. Working on much the same theory, Dr. Elwood A. Sharp, of the Department of Experimental Medicine, Parke, Davis and Co., arrived at a similar decision. The three scientists then developed the new remedy together. Dr. Sharp believes it likely that liver or liver extracts supply an essential substance which is easily formed from ordinary food in the normal stomach but which is imperfectly or scantily formed in the abnormal type of stomach found in the patient suffering from pernicious anemia.

## ITEMS

THE fossil skeleton of a giant hog which stood seven feet tall has been mounted in Morrell Hall at the University of Nebraska. The fossil was dug up in Sioux County, Nebraska. Only two of the giants have ever been discovered, the other being smaller than the university's specimen. The pig, scientifically termed *Dinohyus hollandi*, lived during the late Oligocene or the early Miocene Age, which would give him an antiquity of some twelve million years.

THE discovery of ornamented pottery that belonged to prehistoric inhabitants of Britain, and buried near the pottery a small bird bone, has set an archeologist, Miss Dorothy M. Liddell, on the track of what sort of tools were used by Stone Age artisans in impressing designs in clay household ware. The bird joint fits neatly in the pattern of the pottery, she reports in the current issue of *Antiquity*. It has been supposed that irregular pieces of stick must have been the customary stylus used in decorating such pottery. Leg bones and wing bones of such birds as the rook, magpie, pigeon, blackbird and goose provided irregular joint ends capable of making a wide variety of the designs popular in Stone Age art, Miss Liddell's investigation has demonstrated.

IN England, ultra-violet light treatment is frequently used in all kinds of different circumstances, and the Medical Research Council suggest that probably in many cases the treatment is neither necessary nor desirable. Dr. Helen Mackay made careful observations of the effects of ultra-violet light on the health of some delicate children from the east end of London. They were given cod-liver oil to prevent or cure rickets, and it was noticed that the results of the artificial light were wholly negative. The children receiving the light treatment showed no gain in weight or height, nor were they observed to improve in spirits. They actually had more minor ailments such as colds than the untreated children. This was probably due to their being kept indoors for the light treatment while the other children were taking exercise in the fresh air.

DR. TAMAOKI, of the pediatric department of the Kyushu Imperial University, has just completed a two-year study of over 7,000 children and has concluded that most children with long eyelashes are in poor health, it has been reported to the American Medical Association. The lashes of consumptive children grow twice as long as those of healthy children. Sickly children have longer and prettier lashes than those in good health. The lashes of healthy children will grow about an eighth of an inch during the first year of life, while those of children suffering from scrofula grow nearly a quarter of an inch, Dr. Tamaoki has found. No explanation of the cause of this condition has been made, nor has it been accepted as a definite criterion of the state of a child's health.

A LARGE glacier in the Caucasus has been found to be in retreat during recent years, thus agreeing with similar shrinkages observed elsewhere, notably in the Alps and in Alaska. This is the principal glacier of the north slope of Mt. Elborus, which forms the source of the Malka River. The expedition of the Russian State Hydrological Institute determined that this glacier has retreated 570 meters since 1889, and that during the past ten years its rate of shrinkage has been about 20 meters a year.