

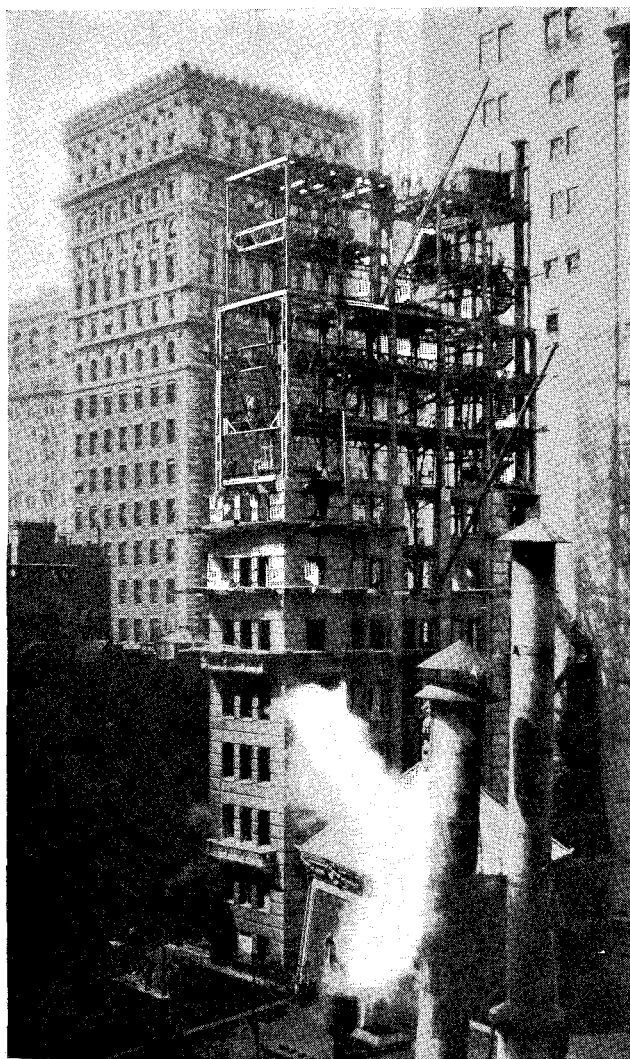
now it has 85, employing 5,000 telephone girls. One building, the Hudson Terminal, has more telephone subscribers than Greece and Bulgaria together!

"The immense telephonic network of New York knows not silence. It is least noisy between 3 and 4 A.M.; at this time there are only ten messages per minute. Between 5 and 6 A.M. 2,000 New Yorkers use the telephone. Half an hour later the number is doubled. Between 7 and 8 25,000 individuals disturb the breakfasts of 25,000 others. At 8:30 A.M. the number of calls rises to 50,000; between 10 and 11 the demands exceed 150,000. It is between 11 A.M. and noon that the telephonic conversations reach their maximum; they then number 180,000."

—Translation made for THE LITERARY DIGEST.

TAKING DOWN A SKY-SCRAPER

THE DEMOLITION of the Gillender Building, twenty stories high, on Nassau and Wall Streets, New York City, to make room for a still loftier structure, has been widely commented on by the daily press, but only on account of its obviously sensational features. It has special points of interest to scientific men and engineers which have not been



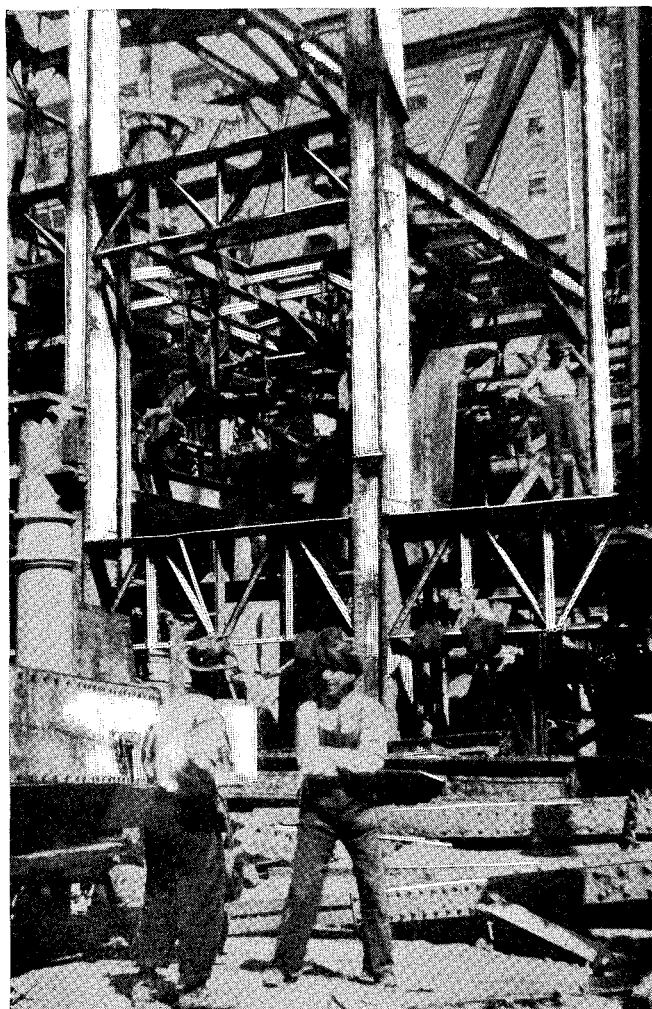
By courtesy of "Engineering News," New York.

THE DEMOLITION OF A SKY-SCRAPER.

When this photograph was taken the steel work of the Gillender Building, New York, had been removed down to the fifteenth story and the masonry down to the ninth story.

insisted upon. As the building has stood fourteen years, this seems an excellent opportunity to see how badly, if at all, the steel frame has rusted, and what may be learned about the best conditions for its preservation. It will be remembered that some engineers have asserted that no steel-frame building can possibly escape rust, and that all will tumble down, sooner or later. A preliminary report on this subject, by Maximilian

Toch, of the department of chemistry of the College of the City of New York, appears in *Engineering News* (New York, July 14). He finds, on the whole, that the steel is generally in a good state of preservation, altho some rivets are corroded. The paint used to "preserve" the steel, made of pure linseed oil, has entirely disappeared, owing to chemical action with the mortar



By courtesy of "Engineering News," New York.

STEELWORK OF THE GILLENDEER BUILDING AT THE GROUND FLOOR.

The demolition of the building revealed the fact that the steel-work had been protected from rust by the cement, tho the paint had entirely disappeared.

—a fact that shows linseed oil to be unfit for this purpose. The cement in which the steel was encased seems to have preserved it perfectly—an interesting and valuable fact. Says Mr. Toch:

"The main feature of the preservation of the steel was the fact that the columns were encased in brick and a rich mortar or grout came in contact with the steel (which also accounts for the complete destruction of the linseed oil). Wherever there was insufficient contact between the grout and the steel, rust formed; but in view of the fact that the construction of the building was such that moisture was very largely excluded, we have only two or three instances where bad rust pitting took place.

"The one great lesson to be learned from the examination of this steel is the fact that those architects who prescribe a cement mortar one inch thick around a column of steel are very wise in their precautions; but linseed-oil paint should not be used when such a provision is made. There are alkali-proof paints which at the same time electrically insulate and serve a better purpose than the linseed-oil paints."

ANTS THAT BAKE BISCUITS—There is always something new about ants, says *Knowledge* (London, July). F. W. Neger, the professor of botany at the famous forestry school at Tharandt near Dresden, has made an interesting study of the custom of *Messor barbarus*, a common ant (in Dalmatia, for instance),

which is at once a leaf-cutter and a seed-gatherer. Says the paper just named:

"Neger noticed that most of the seeds (of Leguminosæ in particular) were allowed to begin to germinate before the ants put them out to dry, and he suggests that this is to burst the seed-coats. But the germination is not allowed to go far enough to ferment the starch into maltose and dextrin. When the seeds are thoroughly dry and dead, they are taken back to the nest and chewed into a dough. This is baked in the sun into minute biscuits, which are stored!"

IGNORANCE OF GEOLOGY

THAT THERE is inexcusable ignorance of simple geological facts, even among persons otherwise well educated, is the complaint of L. De Launay, who writes, in *La Nature* (Paris, June 25), of what he calls, somewhat contemptuously, "authors' geology." Specialists are wont to complain that ignorance of their specialties is rife; but we may concede that when Mr. De Launay quotes eminent writers who think limestone is granite and regard obviously stream-cut valleys as rent by some "prehistoric cataclysm," he goes pretty far toward making his point. We read:

"In mentioning famous writers who really knew a little geology, we may, without going back to Bernard Palissy, confine ourselves to citing Goethe, who had studied it, and George Sand. . . . Outside of these, in the whole course of the nineteenth century, we may say without exception that writers have not had the least knowledge of what geology is, or of what its most familiar terms signify. This is particularly noticeable with those who occasionally allude to it. . . . The very common word 'granite' . . . seems to have especially brought bad luck to great writers. . . . It is easy to see that all of them have an unhappy attraction for this word, which seems to them the synonym of all hardness, massiveness, compactness, etc. And every rock to which they desire to attribute these qualities becomes for them 'granite,' just as every talus slope of 45° is 'abrupt,' 'vertical,' 'vertiginous,' etc.

"We may be content here with quoting Lamartine, who places his cave of the eagles in solid granite—granite, the most unlikely rock to contain any cave at all, especially when it 'distills stalactites.' . . . In a later generation, Théophile Gautier, or his Italian disciple Amicis, was equally ignorant. The Cathedral of Valladolid, among a score of other monuments built of limestone or other calcareous rock, becomes an 'imposing mass of granite.'

"This improper use of geological terms by writers constantly shocks a professional. . . . Prehistoric 'cataclysms' are utilized on all sides to explain either superficial phenomena, with which cataclysms can have had nothing to do, or formations like those of Archean regions, so far anterior to history that it is as absurd to call them 'prehistoric' as it would be to cite Semiramis in a history of the Third Republic. Gautier, who is so wonderful a master of style, and who is able to write 85 pages of architecture on the banal Church of St. Isaac at St. Petersburg, is absolutely incapable of describing geological forms in other than the vaguest and most inappropriate words—'convulsions, vertiginous escarpments, chaos,' for mountains; or on the other hand, 'dusty, sandy, monotonous regions' for a plain. There is, for example, in his works, a description of a trip across the schists of the Simplon which is quite typical in this regard. The only rocks of which he knows even the name—let alone the definition—are granite and marble. . . .

"Among those who know a little, but use their knowledge in a somewhat haphazard way, is that admirable writer Pierre Loti, who, having some scientific education as a naval officer, loves to talk about the 'thousands of years' that have elapsed since the formation of geologic strata. But between the Cambrian and the Pliocene there is no difference for him, and the strata that give him the most extraordinary impression of age—that of the 'earliest geological periods'—are often the tertiary deposits, which are the most recent. Like all those who have heard vague talk of the old-fashioned kind of geology, he readily sees, in the most exclusively sedimentary regions, evidence of convulsions due to fire. The chalky limestone of Cattaro is for him a 'frightful, calcined cliff, rent by the fires of the primitive world.' . . .

"It is astonishing to find that men with so accurate an eye

do not see—in the absolute sense of the word—do not discern strata and arrangements so characteristic—the differences in design and color of a landscape that give a key at once to its real geological constitution. They paint it all, as the old Milanese masters used to do their mountains, under the form of a confused mass of scoria.

"Such a lack of visual education and of geologic knowledge would have few inconveniences if we did not find it also closer to scientific circles—for example, in the works of archeologists or architects. . . . Several years ago, when studying the decoration of the Mycenaean tombs on which volumes have been written, I found, in the abundant literature of the subject, that they were everywhere described as of red porphyry, green breccia, basalt, etc. Procuring some specimens of the rock for microscopic examination, I showed that they were simply of limestone, more or less silicious.

"May we hope that some progress will be made in the future, and that the public will acquire some notion of this interesting science that tells us of our planet's history and enables us to know from its surface, what exists in its depths? If we are to trust in educational programs, we may believe it, but whenever we question young people who have just completed their training, we meet with little success. The cause is doubtless in the form adopted for teaching, in which, instead of its living substance, we have naught but a barbarous terminology, an insupportable aridity. As Hamlet said long ago—doubtless after reading some learned text-book—'Words, words, words!'"—*Translation made for THE LITERARY DIGEST.*

THE FACTORS OF INDUSTRY

THAT CAPITAL and labor are the prime factors in the production of wealth was always a mistaken belief and is now an outworn doctrine, we are told by an editorial writer in *Engineering* (London, July 8). He admits both as factors, but ranks labor second and capital third. First of all he places enterprise, aided by experience and knowledge. We read:

"There is plenty of capital in the city, and plenty of labor walking the streets, yet they do not produce wealth. Enterprise, aided by experience and knowledge in the form of management, is required to utilize these forces—i.e., capital and labor. Labor is the second factor in production, and capital the third factor. It is essential, however, that management and labor should be highly skilled, for otherwise neither can profitably assist capital. . . .

"We have indicated that enterprise, experience, and knowledge are the principal factors in wealth production. This applies to the manager in management, and to the workman at his machine. Modern economics demand this differentiation. Enterprise, knowledge, and concentration are wealth productive, and especially so if confined within the sphere of activity in which experience has been gained. In other words, specialization is the key to profitable production. If these forces are to be utilized for the common good, they will require some form of organization, and a good organization requires good management. If these forces are not organized and managed, unemployment will be prevalent in labor and in the higher spheres of life. We perceive that one of the greatest factors in production is management, and as the evolutionary process advances we recognize this more and more.

"The large producer has many advantages which the smaller has not; he can afford to install new machinery built specially for cheapening production as it appears on the market. As already stated, what is new to-day is old to-morrow, and nowhere is this more true than in engineering. Cheap production is a boon to humanity, for it tends to bring luxury within the reach of all; cheap production in one sphere of activity stimulates further production in other spheres of activity, as it makes possible what in other circumstances might be impossible. As an illustration, let us take the case of a sewing-machine. This is a necessity in most homes, more especially in poor ones. If the cost of producing these machines were high, only the better-class families could afford to buy them; but if the cost of production be low, every family may buy them; and so we come to see that one of the essential factors in human welfare is cheap production. It should be our main object in life, therefore, to bring about a general recognition of this principle; to see that the economic aspect of it is thoroughly understood by the workman himself. But it should be borne in mind that