the difficulty that the advantages shared by the new members are the result of sacrifices on the part of the old, for which the latter are not indemnified. It consequently results that the associations refuse to admit new members, and in good times employ regular workmen hired for wages and liable to dismissal, and thus in the moment of success such associations lose the essential characteristics of co-operative societies.

To meet these difficulties Schulze recommends: —

1. The admission not only of members of the trade, but, as sleeping partners, of persons who, without taking any share in the industry of the association, are yet willing to venture a deposit of capital; and of workmen who enter the association at once, but, as they cannot be employed at once, remain for the time being as wage-laborers under other employers.

2. The participation of new members in the profits only after a certain lapse of time.

3. The application of borrowed capital, and not of the society's shares, to the acquirement of such real property as is required; such borrowed capital not being reclaimable before a certain date, but receiving interest.

4. Withdrawal from the association to be subject to as long notice as possible.

As to division of the profits, most German associations agree with Schulze, that, after the reserve fund has been duly considered, five per cent interest should be added to each business share; that then half the surplus should go to swell the shares as super-dividends, the other half being divided as bonus among all the workmen and officials according to the amount of salary they have received during the year.

It is very difficult to obtain accurate information respecting co-operative undertakings for productive purposes, as, from reasons of trade, such associations are very reticent with regard to their working.

In the report of the German Co-operative Union for 1884, 145 productive associations are mentioned under the following divisions: —

21	Cabinet and instrument makers' associations.
17	Spinners and weavers' "
13	Millers and bakers' "
11	Booksellers and printers' "
10	Tailors' "
7	Butchers and slaughterers' "
7	Brewers' "
6	Cigar-manufacturers' "
6	Carpenters, builders, and stonecutters' "
5	Metal-workers' "
5	Spirit and brandy distillers' "
5	Shoemakers' "
5	Clockmakers' "
24	Miscellaneous "

The same report gives statistics of 10 associations which made a net profit of 5.5 per cent, allowing of a dividend of 13.6 per cent, as against 16.0 per cent in 1883, and 13.5 per cent in 1882. Whether this dividend is paid to the members in money down or not does not appear. Of the working capital of these societies, 36.4 per cent was their own.

Herr Borchet is the only authority who believes that the workmen's participation in the profits has prevented strikes.

The most conspicuous examples of co-operation in production are the Berlin Brass-Work Company, the Windhoff Foundry at Lingen, Möller's engine-works at Kupferhammer, Keilpflug's cigar-factory in Berlin, and the cotton-mills at Hasel.

Of all co-operative enterprises in Germany, the people's banks are the most developed and the most successful, and they appear to have in a great degree overcome the indebtedness and misery which were so often the lot of the working-classes a quarter of a century ago, in consequence of the usurious interest that they were compelled to pay, especially in agricultural districts, on even the smallest loan.

The main principles on which these banks are founded are again those of Schulze-Delitzsch. They are: —

1. The loan-seekers are themselves the directors of the institution established for the satisfaction of their needs, and share the risk and the profit.

2. The transactions of the association are based throughout on business principles: the fund of the association pays to the creditors, and the loan-takers pay to the fund of the association bank, interest and commission, according to the rates in the money-market. The managers, especially those who have charge of the funds, receive remuneration according to their services.

3. By full payment once for all, or by small continuous contributions on the part of the members, shares in the capital of the association are formed, according to the amount of which the profit is divided, and placed to their credit till the full normal sum is reached, by which means an ever-growing capital of its own is acquired for the business of the association.

4. By the entrance fees of members and by reservation of shares, a common reserve fund is accumulated.

5. Sums further necessary for the complete carrying-on of the business are borrowed on the common credit and security of all the members.

6. The number of members is unlimited. Entrance is open to all who satisfy the requirements of the statutes, and it is free to any one to cease to be a member after giving due notice.

Not only artisans and manufacturers, but also others, especially agriculturists, merchants, and dependent workmen, avail themselves of these banks, and they have maintained and strengthened themselves in the confidence of the public through all crises.

The Giro-Union ('Circulation Union') of German associations deserves special notice. An account is opened at the Associations' Bank in Berlin in favor of each people's bank belonging to the Union. Each bank keeps a deposit of at least 300 marks there, which can be increased by deposits in specie, by bills on Berlin or any Prussian bank, or places where there are other loan associations, or by the transferrence of the deposit of a third party from his account to their own: it can, on the other hand, dispose of its deposit by transferrence to another account, kept by the bank, or by checks, bills payable at sight, or ordered consignment in specie. Though Schulze regarded this institution as extremely important, only a minority of the people's banks belonging to the general union belong to it also.

The number of people's banks belonging to the general union was 1,961 on Jan. 1, 1885.

Co-operative societies for educational purposes would appear not to exist in Germany, where educational facilities in every branch of learning are already amply provided for, and within the reach of the poor; but co-operative associations of various kinds often provide educational, social, and recreative facilities for their members.

Societies for building dwellings for the poorer classes have met with but little success in Germany. They appear to have succeeded best in Alsace; and one at Flensburg, in Jutland, founded in 1878, possesses, according to the report of 1884–85, 19 houses, with a value of 100,000 marks, and 800 members, one of whom has the sum of 87,000 marks to his credit in the society's books.

The formerly wide-spread system by which pasture-land, forest, fisheries, etc., were held in common, has almost entirely ceased to exist in Germany, in consequence of recent legislation. On the other hand, a movement has taken place, chiefly under the same auspices as the co-operative movement on the Schulze-Delitzsch principle, by which combination now plays a very important part in German agriculture.

Dairy co-operative associations have been started in all directions. There are further associations for the purchase and use of agricultural machines, the members paying a certain sum for the use of the common property, and associations for cattle-breeding, sheep-farming, hops, vegetable, and vine-insurance, and kindred objects.

THE STONE AGES IN TUNIS.

AN interesting report on the relics of prehistoric man in the regency of Tunis appeared in the May number of the well-known scientific periodical, the *Matériaux pour l'Histoire Primitive et Naturelle de l'Homme*. The author, Dr. R. Collignon, deputed by the Anthropological Society of Paris for this purpose, spent three years in traversing the country in every direction, and in making the observations and collections which are described in this report. Only the principal results can here be noticed; but these, it will be seen, are of great scientific value.

The most important observations were made in the district about

Gafsa, a considerable town in the southern part of the regency, preserving the site and the name of the Roman Capsa. The author describes three remarkable hills, which rise to a moderate elevation in the neighborhood of that town. These hills, having been made posts of observation of the occupying army, are now known as Posts I., II., and III. Post I. is an eminence rising on one side, by a gradual slope, to a height of sixty metres (about two hundred feet) above the level of the town, and descending on the other side in a steep, cliff-like face, of forty-two metres, to an upland plain. This precipitous face offered to the investigator the advantages of a cutting, showing the composition of the hill from base to summit. It proved to be, in the greater part, a limestone conglomerate, in which are embedded small particles of quartz, with rolled flint-stones of various sizes, and fragments of brown silex. Geologically, the hill belongs to the earliest period of the quaternary or pleistocene epoch. The lower half is of stone sufficiently compact to be quarried for building-stone. Above this is a layer, about eighty feet thick, of somewhat looser and more friable conglomerate, with larger embedded stones. And this, again, is surmounted by a stratum of yellow travertine, about six metres (twenty feet) thick, containing no flints.

The remarkable fact is, that throughout the conglomerate were discovered relics of human handiwork, in the shape of wrought flints embedded in the rock. Still more remarkable is the fact that in the lower and harder stratum these relics were all of one sort, while in the upper and looser layer that sort had disappeared, and other kinds had taken its place. In the lower stratum he found specimens of that rude tool — the rudest of all tools — which is described sometimes as the 'drift-implement,' sometimes as the 'axe of St. Acheul,' and by Prof. G. de Mortillet, in his noted work 'La Préhistorique,' as the 'fist' (*coup de poing*), — a stone clipped into an ovoid or almond-like shape, and intended evidently to be grasped at the smaller end and used in pounding or hacking. With these were some of the coarse flakes, or clipped fragments, which usually accompany them. These stone fists and flakes were all in the typical forms which distinguish the work of the earliest quaternary race, — variously known as the 'River-drift,' or 'Canstadt,' or 'Chellean' race, — and were the only traces of human industry found in that stratum.

In the looser stratum above, not one of the ovoid implements was found, though a single specimen was extracted just on the line of division between the two layers. All the worked flints in the upper layer belonged to what M. de Mortillet styles the 'Mousterian' type, but were mostly of a heavy, coarse, and worn appearance. They were of various shapes, — triangular points, thick blades, rude scrapers, and the like. Dr. Collignon is of opinion that the implements in the upper conglomerate stratum were a development of those in the lower; but the facts, as described by him, do not seem decisively to bear out this opinion. Finally, in the highest stratum of all, the travertine, as has been said, no flints of any kind were found. The hill known as Post III. resembles that of Post I., except that it is lower, and that the layer of travertine is wanting.

The necessary conclusions from these facts, as set forth by the author, are, that in the earlier part of the quaternary era this region was inhabited by the race or races of men who formed these implements. During a period of great but unknown length the land gradually sank, and was finally covered by the sea. When it again rose above the surface, the currents swept away nearly all the formation which had accumulated during this subsidence, leaving only a few hills, such as have been described, to indicate the original level.

After this denudation, a new but briefer subsidence took place, giving rise to a new formation, and followed by a new elevation. These facts are shown by the evidences displayed in and around another hill, known as Post II. This is one of the 'foot-hills' of a small mountain-chain which sinks gradually into the plain at a little distance north of Gafsa. Around these hills and on their declivities are scattered many small mounds of clayey loam. These mounds rest on a layer containing many coarse Mousterian implements, exactly similar to those in the upper conglomerate of Post I. Above this layer is a stratum of argillaceous earth, between three and four metres thick, containing no flints. Then follows a thin layer or film of earth, about four inches thick, full of flint implements of every description. This layer clearly indicates what was for a considerable period the inhabited surface. Above this layer are a few feet of earth; but the same implements are scattered profusely over the present surface, and are found below it where the soil is furrowed by the rains. They belong to every one of M. de Mortillet's 'ages,' subsequent to the Chellean and the earlier Mousterian; viz., the upper (or later) Mousterian, the Solutrean, the Magdalenian, and the Neolithic. So far as prehistoric Tunis is concerned, Dr. Collignon is satisfied that no distinction in point of time can be made among these different industries. It is clear, also, that they have continued in existence to a very recent period, since the soil which covers some of the Roman constructions holds flint implements of the same description.

A very curious fact, ascertained by Dr. Collignon, is that all these stone implements, of every age, are restricted to a comparatively narrow area in the south and west of Tunis. While they abound in that district, they are almost entirely absent from the northern and eastern portions of the country. Dr. Collignon does not attempt to explain this phenomenon. It may possibly be due to an early condition similar to that which exists at present in parts of our own continent, where two hostile races, like the Eskimo and the Athabascan Indians, are separated by a wide space of unoccupied land.

It should be mentioned that in the middle of the Tunisian territory there is a limited area, quite distinct from that in which the stone implements occur, where megalithic monuments — dolmens and covered passages — abound. In one locality no less than four hundred dolmens were counted. These monuments Dr. Collignon believes to have been the comparatively late constructions of an intrusive tribe; and he is further of opinion that the descendants of this tribe and of the stone-implement makers still live in their respective districts, and are distinguishable by their very different physical traits. In the district of the dolmens the people are of rather low stature (1.63 metres, or about 5 feet 4 inches, — an average which must be understood as including both sexes), with long heads (index 74), and a visage short, broad, and irregular, closely resembling in outline that indicated by the Cro-Magnon crania. On the other hand, the people of the south of Tunis are comparatively tall (1.69 metres, about 5 feet 6 1-2 inches), very dolichocephalic (index 73), with retreating forehead and chin, and projecting glabella and brows; the nose turned up, and the lips thick, but with no prognathism. They are neither negroid, Berber, nor Arab. In his view, they represent the earliest ethnic stratum of the existing population, and preserve the blood and the type of the people who dwelt in this region during the stone ages.

The positive conclusions which we seem authorized to draw from Dr. Collignon's report may be stated in a few words. They are, first, that the human race is of an immense antiquity, dating back to the beginning of the quaternary age; and, second, that the first race of men, judged from the relics of their industry, were of a very low grade of intelligence, little surpassing that of the most sagacious brutes; but how far this apparent defect of intellect was real, and how far it may have been due to the circumstance, that, as M. de Mortillet has suggested, the faculty of speech was yet undeveloped, is uncertain. Finally, it is plain that the period of this earliest stone age was of a vast duration, which can only be expressed in geological terms. The same may be said of the early Mousterian era, which perh aps formed part of the first age. As for the various so-called 'stone ages' which followed, it seems impossible to make any real distinction of periods among them. They all apparently form one modern epoch, not of very great duration, and not yet closed.

CHILLED ARMOR FOR LAND-DEFENCES.

THE Gruson Works of Buckau-Magdeburg have recently published a book of some size, written by Engineer von Schuetz, in which the system of construction of chilled cast-iron armor for use in the protection of earthworks and in the making of turrets for land-batteries, as devised by Dr. H. Gruson, some years ago, is described at length, and an account is given of the results of the experiments which have been made, from time to time, by several European governments, to determine its efficiency in resisting the impact of the heaviest modern ordnance. This work has been