sing voltage is applied to the electrodes, and as a result a reversing current flows through the ground, thereby creating a potential field the polarity of which reverses with each commutation.

Two pick-up electrodes, entirely independent of the power electrodes then are placed at any two locations in the area. These pick-up electrodes are connected to a second commutator, which turns on the same shaft as that of the power commutator. Thus, as the power circuit is commutated, the pick-up circuit is commutated in synchronism. The reversing potential that appears between the pick-up electrodes thereby is "rectified" back to d-c pulses, which can be measured on a potentiometer. The potentiometer is connected only during the steady state part of each pulse, so that the inductive effects during each build-up and build-down period will not affect the measurement. In other words the measurement is essentially a d-c one, and as such it is easier to carry out accurately than the a-c measurements of the inductive method.

The aim of the commutation is this: Contact potentials and potentials arising from chemical reactions are often of the same magnitude as the potentials to be measured. These stray potentials, therefore, must be eliminated. The commutation performs this task by averaging out to zero all potentials except those produced by the power circuit.

By choosing a sufficient number of points and by measuring the potential that appears between any two of them, a map of the surface potential may be made. Any distortions in this map indicate, through proper interpretation, the presence of conducting bodies. Surprisingly accurate maps may be made by this method, but it remains for proper interpretation to locate correctly whatever conducting ore bodies may be present.

This description of the four most important methods of electrical prospecting must not lead one to believe that they are restricted to the vulgar purpose of revealing rich ore deposits. They have also many valuable applications in general engineering such as locating the depth to bed rock and faults in foundation problems, locating underground water supplies, and many others. In pure geology electrical prospecting is a tool of no mean significance.

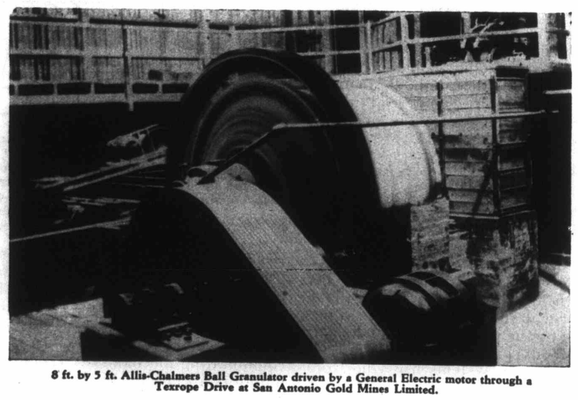
Little has been said about the specific methods of interpretation applied to the different types of maps that may be constructed by these methods, because the potential theory involved is difficult, and also because experience and judgment play so large a part in it. Often the problem is reproduced on a small scale in the laboratory, and an attempt made to reproduce the given map from different configurations of conductors.

In general, the problem of interpretation may be stated in this way: "Given a definite type of distortion in a geophysical prospecting map, is it possible to predict definitely the type, the size, the location, and the depth of ore body that caused that distortion?" Generally speaking it is not possible to do so; but with experience, and by using all the information mining engineers and geologists are able to supply, and by using all possible methods of geophysical prospecting, enough information may be amassed so that the resulting conclusions are not far from the geological truth.

It is, of course, a great deal to expect that any one type of exploration will indicate any more than one property of the deposit; and even though all the electrical and physical properties of the deposit could be determined, whether or not the ore were worth mining still would remain an open question. It is well to remember, therefore, that the results of electrical prospecting are not a law unto themselves but rather must be used as an aid, very often a very valuable aid, to the methods of prospecting that have been in existence since mining began. It is well to remember also that the urgency of finding a successful electrical divining rod has led to many abuses of the methods here described which in no way detract from their essential value.

Official announcement is made that Schreiber Pyramid Gold Mines plans to install a small mill on its property four miles north of Schreiber next Summer to treat high grade ore from surface veins.

Delta-Star Electric Company, Montreal, are moving their office from 980 St. Antoine St. to 750 Belair Avenue in order to have location at their plant.



8 ft. by 5 ft. Allis-Chalmers Ball Granulator driven by a General Electric motor through a Texrope Drive at San Antonio Gold Mines Limited.

Wills Maclachlan

ELECTRICAL SHOCK ... and After

Where Do We Stand?

By Wills Maclachlan,

Consulting Engineer, Toronto.

WHERE do we stand today in regard to the treatment of electrical shock? Due to the serious effect of electrical shock accidents, this is a question that is certainly being asked not only by laymen but by the medical profession.

A considerable amount of study and research is reported in medical literature, but until the last ten years this has for the most part, been the result of individual effort. Under the leadership of the late Dr. J. J. R. McLeod, when Professor of Physiology of the University of Toronto, research into electrical shock was carried out by Dr. Ian Urquhart and Dr. Clark Noble. Their work gave a new impetus to the study. Research was instituted in various universities in the United States under the leadership of the Rockefeller Institute, a number of papers being published. Independent important work was carried out by Dr. Williams, Professor of Physiology of Columbia University. Recent work in the University of Toronto under the leadership of a committee, the chairman of which is Sir Frederick Banting, has been done by Dr. Ettinger. To make available to these research workers, the clinical or field information, the writer collected the exact information of a considerable number of electrical shock cases in Canada and the United States and reported upon the findings.

Problem Not Yet Solved

The problem is by no means solved; much more research and field study must be carried out and study given to the results so far obtained. Caution must be exercised in translating the findings obtained from working on laboratory animals to use upon human beings in the actual cases in the field. Those making the translation must fully realize their responsibility for the lives in their care. There are, however, certain facts that have been developed which are fairly definite and may be used as a brief summary of the present situation.

Research Findings

The passage of electrical current through a man causes paralysis of the higher nerve centres causing breathing to stop, preventing normal reflex nervous responses and causing lack of tone of the blood vessels.

The heart may be thrown into ventricular flutter, developing later into ventricular fibrillation. There is good evidence that this is recoverable from.

If the fibrillation passes off, expulsive beats may be induced by Adrenalin. If Adrenalin is given before fibrillation passes off, it will lengthen the fibrillation. Hence it is not safe for a doctor to administer Adrenalin unless he knows that there is no ventricular fibrillation present. The only sure test is by electrocardiograph, which is not available in actual cases.

If the contact is of short duration the chance of recovery is better. If artificial respiration is applied without delay after shock, the chance of recovery is better. Warmth assists.

Electrical counter shock has not proven to be of practical value. The administration of oxygen or oxygen plus CO_2, has not in laboratory animals been proven to be of value.

Success in resuscitation decreases in hot summer months and increases during the middle of the day.

Because of the lack of normal reflex nervous responses, the normal tests for life fail and should not be taken as evidence of death. It has been possible to resuscitate from electrical shock after hours of effort although ordinary signs of life were absent.

Because of the lack of tone of the blood vessels, it is at times fatal to allow a patient after being resuscitated from electrical shock to sit up or to stand.

Artificial Respiration Demonstrations Needed

Clear, simple explanations and demonstrations in artificial respiration should be given to the staff. Each member should be given the chance to act as patient and as operator. Details in printed form should be supplied. Regular practice in artificial respiration should be established. It is not enough, that the practice be carried out when there is a rainy day. A regular time should be set apart and a record made of the attendance at the practices. The great value of regular practice is in developing a habit that will assist men when they might lose their heads in an emergency. In actual cases this has been proven many times.

Five Important Points

The five most important points to remember are:

1. Clear the patient from the contact with the live

(Continued on page 53)