

FROM THE OTHER SIDE

Das 75jährige Jubiläum der Society of Exploration Geophysicists (SEG) in 2005 schlug sich in THE LEADING EDGE, dem Fachorgan der Gesellschaft, in zahlreichen Arbeiten nieder. Im Startartikel von Dean Clark ist zu lesen (s. Seite 3), daß die US-Geophysiker, so wie Mintrop, bereits im 1. Weltkrieg mittels Refraktion Feindbatterien geortet hätten. Faktum aber ist: Mintrops Patent datiert von 1917. resp. 1919, während die US-Geophysiker vom Refraktionsverfahren damals noch keinen Schimmer hatten und erst 1925 die ersten Systeme entwickelten, (die von Mintrops Apparatur abzukupfern sie keine Mühe scheuten. Siehe auch Seite 7!).

Über 60 eMails und zahlreiche Materialsendungen an Lee Lawyer, dem "Chef-Kolumnisten" von TLE, der in bewundernswerter Weise mein Anliegen unterstützte, waren nötig, um die Prioritäts-Debatte einigermaßen erfolgreich abzuschließen.

Gerhard Keppner

Extracted from THE LEADING EDGE October 2002

FROM THE OTHER SIDE

A column by Lee Lawyer with stories about geophysics and geophysicists

By the time you read this you will be ready to go to Salt Lake City for the Annual Meeting, i.e., the convention. *Remember* that the Honors and Awards and the Presidential Session are on Sunday afternoon this year rather than on Monday morning. I am unclear why the change was made. Perhaps it was the low attendance at the Presidential Session last year. It is difficult to see how moving the session to Sunday afternoon can enhance attendance ... but ... it is possible to enhance *apparent* attendance. The session is usually scheduled for a huge auditorium, with a seating capacity of 15 000 or more. Hold the session in a smaller venue! That way it will look as if you have packed them in with standing room only. Asell out! Tento- one says that no one has thought of this simple solution. History lesson (probably repeated): Twenty-five years ago, H&Aplus the Presidential Address were held during the allconvention luncheon on Monday. When we became too large for this "sit-down" luncheon, H&Awas moved to Wednesday night and called "Awards and Music." The Presidential Address and the keynote speaker were moved to Monday morning. After many enjoyable Wednesday evening shows, Awards and Music was considered too expensive. It was cancelled and H&A was moved to Monday morning to join the Presidential Session. Currently, the Presidential Session and H&A are to be found on Sunday afternoon. Plan to attend.

Gerhard Keppner, writer of "Ludger Mintrop" (*TLE* 1991) and "Waldemar Zettel and the rebuilding of Prakla" (*TLE* 1998), has a literary bent on the thumper subject.

"As a persistent reader of *TLE*, and especially of your column, I learned with amusement in the July issue what tremendous shock-effects some people credit the vibrators. If you had read Ken Follett's novel *The Hammer of Eden* you would know that a single stolen vibrator—"The hammer"— could serve as a blackmail device to terrify the government of California, yes, and

finally it succeeded in releasing an earthquake (San Andreas Fault, I suppose). I had the pleasure to help the German translator correct the first 40 pages in which the method of vibroseis is explained. The German edition is called: *Die Kinder von Eden*, that is *The Children of Eden*."

Thanks, Gerhard. I tried to read Follett's novel. It is truly science fiction (or fictional science). I recovered the September 1991 *TLE* from my archives and reread your article on Ludger Mintrop. This is truly an outstanding biography of one of the most important if not the most important figure in the history of seismic exploration. In the United States, we have a monument to John Karcher for his work with reflection seismics but have lost our perspective with regard to earlier contributions to geophysical exploration done by Mintrop in Europe. He started it all with a mechanical seismograph and a separate photographic recording device. Quoting from Gerhard's article: "A classic depiction shows Mintrop's system in the working position: On the right is the vertical pendulum—the geophone—and on the left the photographic unit—the recording instrument. The mass of the pendulum was made up of a 4 kg lead ball suspended elastically from a laminated spring. As a result of its inertia as a static pole, the mass remained stationary when seismic waves affected the housing and made that vibrate. The relative movement between the static mass and the moving surroundings had then to be amplified and recorded. Mintrop solved this problem with an ingenious system made up of laminated springs, mirrors, a directing magnet that returned the mirror to its resting position after tilting, a convex lens and a light recorder, which was set up 1 m away. The recording unit sent a concentrated light beam to the mirror on the seismograph and picked it up again to record it photographically."

In 1921, he found the Meissendorf salt dome in Germany using refraction methods. It was a Mintrop crew (Seismos) in 1924 under contract to Gulf Oil that discovered the first productive salt dome using seismic methods, the Orchard Dome in southeastern Texas. One can only imagine the impact on oil exploration when the news of the discovery was made public. A new black box method was born and Mintrop's place in the history of our industry was ensured.

As an aside, one of Mintrop's early attempts at recording seismic waves used a four ton steel ball dropped from a height of 14 m. That must have made a heck of a thump, speaking of thumpers.

Guillaume Cambois had a neat article on acquisition geophysics in the July *TLE*. Believe it or not, I read it. Everything seemed plausible to me until I hit an item that referred to slipsweep vibroseis. There is upsweep, downsweep and even a random sweep but slip-sweep? Guillaume responded.

"The most complete description of slip-sweeps is given in an article by Burger et al. (1998 *TLE*). It was invented by Shell in Oman (PDO). To increase productivity, 3D surveys in Oman were usually shot using two sets of four vibrator trucks. While one set was vibrating, the other was moving to the next shot point location and started vibrating as soon as the previous shot was finished. This technique was called flip-flop shooting, as a reference to marine acquisition.

"To further improve productivity, the second set of vibrators can start sweeping before the end of the previous shot point. This is possible because the two sets are not sweeping the same frequencies. Getting all the shots sorted out is a bit messy, but modern recording systems do it automatically. There is, however, a problem with harmonics. Asynchronous sweeps are perfectly separable as long as there are no harmonics.

"To minimize the problem, the second set of sweeps only starts after its first harmonic is out of the range of the previous sweep. This time lag is called the slip-time. The technique, known as slip-sweep, can be extended to three or even four sets of vibrators. This really improves productivity because many shots occur at the same time. Intriguingly, this technique is not used much outside of Oman. Hard to understand why; my experience processing these data has been extremely positive. Perhaps it will become mainstream some day, or perhaps it will end up in the ash can."

Thanks for the update, Guillaume. In the slip-sweep method, if the slip is constant, the two sets of vibrators are locked together, so to speak. Move time has to be coordinated. Maybe, if I looked up the reference I would know the answer to slip time issue. Back when, we tried to use two sets of vibrators at the same time (slip equals zero), one set sweeping up and the other down. I can't recall who espoused that technique but it certainly saved field time. I seem to remember that the resulting profiles were noisier. Anyone? **TLE**

In the United States, we have a monument to John Karcher for his work with reflection seismics but have lost our perspective with regard to earlier contributions to geophysical exploration done by Mintrop in Europe.

Extracted from THE LEADING EDGE January 2005

The 1920s—the decade it all started

DEAN CLARK, TLE Editor

SEG was founded, with the same acronym but a different name (the Society of Economic Geophysicists), on 11 March 1930, in Houston, USA, which means its 75th anniversary is almost here. *TLE* will, in honor of this anniversary, publish short monthly articles that focus on the history of applied geophysics during that period and the role that the society itself has played in the evolution of the science and profession. These articles are expected to be primarily pictorial; readers are urged to submit appropriate photographs, and information about 75th Anniversary events to dclark@seg.org.



The photo collage (right) predates the founding of SEG (which was renamed the Society of Petroleum Geophysicists in 1931 and assumed the final version of SEG in 1937) to provide some pretext for reviewing the events that led to the need for a professional society of applied geophysicists. The items in the collage are related as are, and will ever be, the names associated with them, Karcher and Mintrop. John C. Karcher and Ludger Mintrop were both involved, on opposite sides, in using primitive seismic techniques to locate enemy artillery during World War I (*Geophysics in the Affairs of Mankind*, SEG, 2001). After the war, these two men independently began to adapt this tool for military reconnaissance into one for resource exploration.



A photo from Mintrop's seismograph field manual shows the tent used to develop the seismogram after registration of the data. The tent has a red liner and constructed so that light cannot penetrate it.

Karcher, working with some of his former professors at the University of Oklahoma, had his equipment ready for field testing in 1921 and in July of that year obtained what is considered the first reflection cross-section. The brown part of the collage (in the background) is a copy of some data that Karcher recorded later in 1921 and which is now in SEG's Geoscience Center.

This early work convinced E.W. Marland, of the Marland Refining Company, to hire Karcher's group for two months of reflection work near Ponca City, Oklahoma. However, the price of oil plummeted (sound familiar?) because of new discoveries made without the aid of geophysics. Karcher's contract was not extended, so he sold his equipment and patents and left the infant geophysical industry. He would, later in the decade, return with historic results.

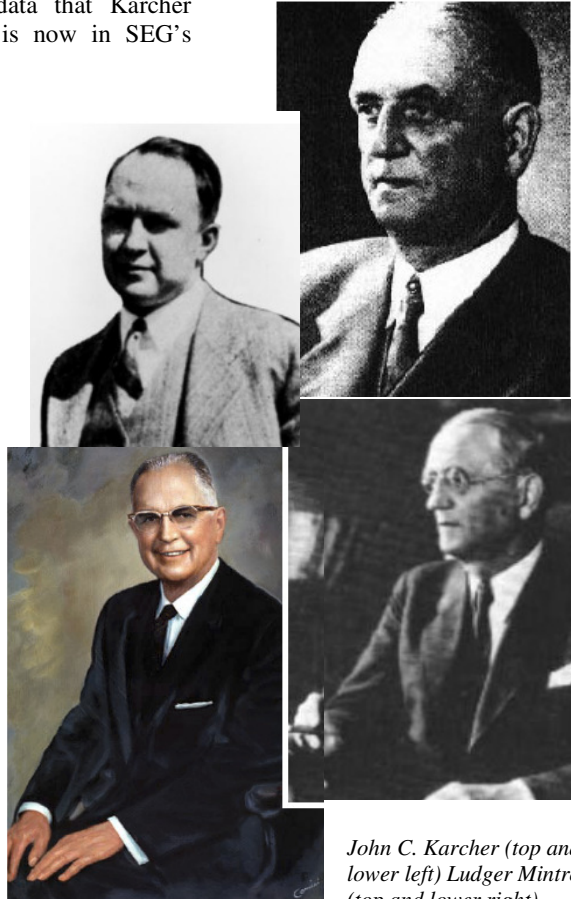
Ludger Mintrop filed for a German patent in 1919 under the name "Method for Determination of Rock Structures." He founded the company Seismos Limited in 1921 (which is still around, several mergers later, as part of Schlumberger). The pages reproduced in the collage are from a field manual for one of the seismographs that Mintrop brought to the U.S. in 1923 when Seismos was hired to conduct seismic surveys in Texas and Louisiana.

This Seismos crew did not locate any prospects, but a second crew, working for Gulf Production Company, pinpointed the Orchard Dome in Texas in 1924. This is considered the first discovery via seismic of commercial quantities of oil.

It was not, however, the first commercial discovery via any geophysical method. Earlier in 1924, Amerada had discovered the Nash salt dome in Brazoria County, Texas, with a torsion balance. The first producing well

on the structure was completed in 1926. This work was done under the supervision of Donald C. Barton, the key figure in the early years of SEG and the subject of next month's article.

TLE



John C. Karcher (top and lower left) Ludger Mintrop (top and lower right).

Extracted from THE LEADING EDGE April 2005 pages 346 and 348

FROM THE OTHER SIDE

A column by Lee Lawyer with stories about geophysics and geophysicists

This following letter from Gerhard Keppner



refers to “The 1920s—the decade it all started” by TLE Editor Dean Clark in the January 2005 TLE.

I hesitated writing this mail, but for the sake of historical correctness I have to do it, particularly as TLE starts an extensive traceback in history: Not correct is Clark’s statement: “John C. Karcher and Ludger Mintrop were both involved, on opposite sides, in using primitive seismic techniques to locate enemy artillery during World War I.”

First: Only Mintrop detected enemy gunfire by his refraction seismic device and method, which was at that time completely unknown on the other side. His opponents tried to locate enemy guns by measuring the sound wave through air; they were “sound rangers” and this method has nothing to do with seismics. Until the first parties of Seismos entered the United States in 1923, the refraction method was unknown there, but later adapted and enhanced. (By the way, you can’t detect guns by reflection seismics.)

Second: Mintrop’s wartime device was not at all primitive or simply a forerunner. His 1917(!) patented Field Recording System (see page 24 of “Ludger Mintrop” in the September 1991 TLE!) hardly differs from the later so extremely successful apparatus.

Let me add two quotations, which throw a light on my statements: Donald C. Barton wrote 1927 in the November issue of Economic Geology: “...he (Mintrop) developed his instruments and technique during the war (!), and by 1921 had demonstrated the potential of the method... Late in 1923 the Royal Dutch Shell introduced his method into Mexico, and about the same time he got Marland Oil Company to try out this method in the Mid-Continent area. Slightly later, Gulf Production Company tried out the method on the Gulf Coast salt domes.” Isaac F. Marcossou wrote in the Saturday Evening Post (3 March 1928 in “After Petroleum—What?”) that “Baron Mintrop, a German nobleman, is largely responsible for the development of the standard oil-field apparatus now in use. His war (!) experiences equipped him to employ it on geological formations. He made the first survey in this country with his own staff of operators and instruments. Thus, indirectly, the great conflict (World War I) has made a valuable contribution to the petroleum industry.” As we say: War is the father of all things...

“Baron” Mintrop, the “nobleman”, son of a farmer and one of 15 siblings, might have smiled when reading this.

I responded to this letter as follows:

I don’t believe Dean gave any thought to the idea that sound ranging by the allies was seismic or not. Even to call it geophysics would stress the geo part.

I believe that the Mintrop seismograph is purely mechanical. I am sure that he updated it sometime later but I don’t know when. His competitors for recording instruments were GRC and Petty. Maybe Gulf. Maybe that is where the primitive comes from, mechanical to electronic.

I have always thought that DeGolyer brought that Seismos crew to Mexico for Mexican Eagle. I know that Shell bought Mexican Eagle but DeGolyer was a consultant for them, I believe. Bob Sheriff went through DeGolyer’s papers up in Dallas and found contract(s) to Seismos. He didn’t make notes as to the dates or location.

You say that the refraction method was unknown in the United States. Sweet says that Karcher et al. experimented with both reflection and refraction methods in 1921. As you know, that effort went down the tubes when the price of oil dropped dramatically. Sweet says that Gulf picked up the Mexican Eagle crew and got one other for a total of three Seismos crews working for them in 1925. Gulf developed the fan shooting method that was so successful finding salt domes in the Gulf of Mexico on shore.

I don’t think anyone should (or would) disagree that Mintrop was responsible for the introduction of seismic methods (refraction) into the United States and to the world. Keep putting your keen eye on anything we try to pass off as history. It is most welcome.

This was answered by a second letter from Gerhard Keppner:

Your remark to “keep putting your eye on anything we try to pass off as history” encourages me to follow your advice.

Mintrop’s refraction device for artillery detection proved so efficient that General Ludendorff, the German chief of staff, ordered the construction of 100 systems after the Somme massacre in 1916. With his apparatus (patented in 1917 and 1919), Mintrop discovered the Meissendorf salt dome in Germany in 1921. The startling success of Seismos in the States later on is well known. E.L. DeGolyer was rather skeptical at first concerning the seismic method, maybe caused by the failure of Geussenhainer’s party in Mexico (1923). He opted for the torsion balance. He

founded the GRC together with J.C. Karcher in 1925, after the efficiency of the refraction method became evident. In the same year (25 March 1925) Dabney Petty wrote the famous letter to his brother: "Scotty, I am going to enclose a copy of a paper that the Seismos people put out..." It was that letter that sparked the beginning of the Petty Geophysical Engineering Company. We may assume that 1925 was the year when the first American groups were formed to construct refraction (and reflection) seismic tools and to adapt the method, provoked by Mintrop's tremendous success in the States.

In D.C. Barton's article "The seismic method of mapping geologic structure" we find 10 salt dome discoveries (partly with oil) made by Seismos in 1924-1926 and two domes found by GRC in 1926. The first oil found by GRC happened in 1927 with small shows. Two other groups scored discoveries in 1927 and 1928, Humble Oil and Refining and Calcasieu Oil.

We may define Mintrop's optic-mechanical system as "primitive," but we should consider that a first step is always the hardest—but the most decisive. Subsequent improvements in hardware and method, incorporation of electrical means, fan shooting, and the like are remarkable and important but normal in a certain sense. They should not darken the renown of the man who "sparked the beginning."

(Edison's phonograph was a funny creation, but it worked! And nobody would say, mockingly, today: "Not bad, that thing, but why did poor Edison fail to take the next step and invent the disk?")

You wonder whether Mintrop made out financially? I suppose not. He was a professor in Breslau after having quit his Seismos. Probably he had enough to eat and sufficient money to buy his beloved cigars.

I hope you don't mind my somewhat stubborn argumentation. But TLE is such an important publication for our profession that it is worthwhile to contribute.

I then responded to the second letter:

Not only do I not mind your "somewhat stubborn argumentation" I greatly enjoy it and encourage it. You are correct in your concern about our treatment of Mintrop's role in seismic exploration. I have heard about Karcher's contributions many times but seldom does the early work of Mintrop get mentioned. There is a monument to Karcher in Oklahoma City on the site of his early experimental work. Where is Mintrop's monument?

It seems appropriate during SEG 75 that we make sure that our emphasis is "fair and balanced." TLE

Extracted from THE LEADING EDGE June 2005 Page 570

A couple of months ago, I was asked to work up a timeline for geophysical advances/ developments post 1950. I was so accustomed to discussing the 1920s that this brought me up short. Without too much thought, I listed over 30 items. Wow! Could you list 30 advances in geophysics since 1950? Actually, looking over my list, I believe I could divide some of them up and get to 50. One of the really greatest advances was the initiation of "From the Other Side" in TLE but I didn't count it.

.....

Steve Rhea sent the following note regarding artillery location methods in WWI.

I'm not presenting myself as an expert on this, and I don't intend this as a rebuttal to Gerhard (see April's FTOS), but I thought I'd throw it in. I remember seeing an orientation film on the seismic industry that I believe was made by Shell Oil in the late '70s. In discussing early uses of seismic methods, they mentioned the French using primitive "geophones" during World War I to detect the energy of refraction waves created by the firing the Big Bertha heavy artillery pieces towards Paris. The film had animated examples showing the acoustic energy traveling from the guns towards the target, showing both airborne and subsurface waves. I think Shell must have had a fairly good historical basis for this claim, but I can't quote any sources. Still, I find these discussions very interesting. Thanks to all contributors.

Thanks for the note, Steve. I know that you are accurate in your recollection of a film that was produced back in the 1970s if you are referring to the one on the history of GSI. That film did exactly as you describe, with animated examples showing the travel paths of the air and refractions. Unfortunately, the GSI film was incorrect. As far as I can tell, the French, British, and the Americans used sound ranging rather than seismic refractions. Those primitive "geophones" were microphones. Most of the variations in technique between the systems employed by the British, French, and the Americans were in the recording systems. Sweet (in *The History of Geophysical Prospecting*) has a couple of chapters on this subject. The American instrumentation was largely developed by the Western Electric Company in cooperation with the Sound Section of the U.S. Bureau of Standards.

Mail-Dialog zwischen Gerhard Keppner und Lee Lawyer

Abgang der Mail am 28(!) Juni 17:29 (German time),
Antwort am 27(!) Juni 20:40 (Texan time).

Dear Lee,

Encouraging that the April's FTOS has thrown back an echo. Steve Rhea's note makes evident: the Statements in that FTOS were no waste of words: (A microphone is no geophone! Thanks for your clarification!) It's not quite shure that we both shall live to see the 100th SEG Anniversary. Looking forward to this event we can hope that the aforesaid "clarification" had not shrunk to a tiny footnote.

Best regards
Gerhard

Gerhard,

You must remember that the SEG Anniversary is the same as mine! No problem with the 100th. I will still be writing FTOS (somewhere).

....By the by, we will have a Mintrop Seismograph set up in the History Area! Have I ever let you down? We probably will have refraction maps from Seismos crews as well in the 20s Decade Display.
Lee

PS:

Mit "History Area" und "Decade Display" bezieht sich Lee Lawyer auf die große Ausstellung im Rahmen der 75sten Jahrestagung der SEG, die vom 6. bis 11. November in Houston stattfindet. Die Entwicklung der Explorationsgeophysik wird dabei in Dekaden gegliedert und mit Schautafeln und Exponaten dargestellt.

Seebruck, den 25. July 2005
Gerhard Keppner

Extracted from THE LEADING EDGE Sept. 2005 Page 874

Did you know that geophysicists were immune at one time from lawsuits filed because of patent infringement? This mostly happened before my time but I have a vague recollection of something like that. Recently, Tom Fulton has been stirring up the GSH archives in preparation for the convention in Houston (because the Geophysical Society of Houston will provide most of the artifacts that you will see there) and he came up with the following information:

The 1937 Settlement of "Seismic Immunities Group" (Sun and most of the other petroleum industry

resulted from a suit filed by the Texas Development Company who had McCollum and other patents. Initially 64 patents were involved including 2 of Mintrop, 10 of McCollum, 2 of Hayes, 8 of Fessenden, and 2 of Karcher. We need a short write up of the collection of the patents and results. It is important because it allowed the group (by paying a fee) to use each others patents. The last patent considered by the group was the Mayne CDP patent.

Early on there were rumors (according to one of Farr's profs) that Texaco had boarded a ship carrying Mintrop's equipment to New Orleans and taken them.

At one time, I also thought that there was a tacit agreement that mineral permits were not necessary between majors. I know from personal experience that that was not the case. I wrote to Exxon for a mineral permit (a permit to conduct seismic operations). A letter came back denying my request! Boy, that made me mad. Almost simultaneously with the no-permit letter from Exxon, I received a permit request from them on an entirely different area. I copied their no-permit letter, changing the name and location and sent it back to them. Two days later, Chevron's division manager (I was division geophysicist) came in my office and politely asked me why I was starting a war with Exxon. He had received a call from our VP who had received a call from their VP. I told him that I believed in reciprocity. He told me that he believed in peace and quiet. He won. I rescinded the no-permit but Exxon's stayed in force. No justice.

It is a little hard to believe that Texaco would participate in piracy on the high seas. I know that Mintrop was very security-conscious. His seismographs were jealously guarded. Rodney Robinson (ex-Chevron and founder of GeoSearch) has some interesting comments:

While you are documenting history, I thought I would pass some on to you. One of my old (long dead) mentors was Paul Davis Sr., a Midland civic leader and very successful oil man. Paul claimed to have brought the first refraction seismic crew to West Texas in 1929 for Roxana Petroleum (which was either a Shell entity or was merged into Shell). He was one of the founding trustees of the Permian Basin Petroleum Museum in the 1970s, and recruited me as board member in the early 1980s. He had lots of old photos of the crew and their equipment, which he gave me. I kept them for many years, and upon his death I gave them to the museum. He also told me lots of stories about their experiences. He said the instruments were German made, that the Germans who operated them were also charged with making sure no one else could open up the boxes to see what was inside, and they guarded them vigilantly. He said that the Germans were homesick, spoke little or no English, and missed interaction with their countrymen.

On one occasion there was a weekend festival at a German community somewhere southeast of Midland (St. Lawrence, Rowena, or San Angelo maybe), and so they talked the German workers into going and provided them transportation. While the Germans were gone, Paul and his team opened up the boxes to see how they worked. I

don't know if that was the first attempt at "reverse engineering" or not, but he said the look turned out to be very beneficial to them.

Some of the photos he showed me were of stacks of boxes of dynamite the size of a house. He said once one of those stacks was detonated accidentally by lightning or static electricity, and the force blew out all of the windows in the nearby town, also causing a stampede of a large herd of cattle that had been gathered and brought to town for shipping on the railroad. Paul had all of the doodlebugging he wanted, and moved to the Roxana land department. In 1935 he and a friend became partners as very successful independent oil men, and I think their partnership lasted nearly 50 years.

Philippine Islands. (How he got back to the United States right before WWII is another story.) In the early 1950s, Western bought his company. Part of the deal was for Western to build a geophysics building at Stanford and set up an endowed chair for Josh as head of the department.

Thanks, Gordon. Perhaps Texaco thought they controlled the patents since they had rights to Mintrop's patents although that doesn't seem to apply to the reflection method. There may have been no distinction between reflection and refraction when it came to patents. DeGolyer/Karcher got a deal with Reginald Fessenden for patents in 1925 when they started the Geophysical Research Company. TLE

Extracted from THE LEADING EDGE Nov. 2005 Page 1092

Gerhard Keppner is my resident expert on "Seismos" and Ludger Mintrop. Gerhard has sent me a lot of authentic material. He is the author of a TLE article on Mintrop (September 1991).

Just now received and studied your September "FTOS." I think you are right when you doubt that Texaco's piracy was not real piracy. The company had bought Mintrop's patents and Mintrop had to visit Texaco once a year as consultant. This implies harmony between the company and Mintrop. Mintrop's last trip took place in 1939, an unpleasant time. I quote my own article: "...it happened that he was on board the Bremen when the ocean liner in a daring ride broke through the British blockade in order to return to Germany after the outbreak of the war."

Thanks, Gerhard. The allusion to Texaco was a response to a comment that Texaco committed piracy to get their hands on Mintrop's seismograph. Clearly, Gerhard's comment puts an end to that rumor. We sometimes forget to put things in a context. The initial crews were made up of German nationals, especially the party chief and instrument operator. One can imagine some of the difficulties in 1925 with German crews in the United States. However, I have heard no stories along those lines.

In the September TLE, we had an item on the Seismic Immunities Group, which was an organization set up to share patents owned by each participant. Part of this history involved a Texaco lawsuit against Sun for patent infringement. The following is from Gordon Greve, former chief geophysicist of Amoco.

My old college professor, Josh Soske, was present during the hearing of the suit brought against Texaco to allow everyone to use the reflection seismic method and invalidate their patent claim. According to Josh, everyone was standing around waiting for the trial to start when representatives from both sides came out and said there had been a settlement; the trial was over and everyone could use the reflection seismic method with no strings attached. At the time Josh had a small seismic company doing business primarily in California but also in the

Im Märzheft (2006) von "The Leading Edge" erschien die untenstehende Zuschrift von Charles C. Bates, CoAutor des bereits in den frühen 80er Jahren erstmals erschienen Werkes "Geophysics in the Affairs of Man". In einer Buchbesprechung von Dr. Th. Krey finden wir den Satz:

"The strong Impetus to this development by Mintrop and his Seismos company by 1924 is only shortly mentioned."

Die sonderbare Sicht der Dinge hat sich also Bates bis in die heutige Zeit bewahrt. Fairerweise hat mir die TLE-Redaktion vor Erscheinen der Zuschrift Gelegenheit zu einer Replik gegeben.

Gerhard Keppner

Extracted from THE LEADING EDGE March 2006 Page 371

Dear Editors:

In that mild hassle by Gerhard Keppner (April 2005) regarding Ludger Mintrop's role in World War I, please note that Keppner had it wrong—General Ludendorff authorized only 100 "troops" and not 100 "systems" and even then Mintrop did not command these troops. The technique must not have worked very well because mechanical seismographs in those days were lousy as well.

In contrast, sound-ranging got pretty sophisticated—Conrad Schlumberger was in it for the French, Nobel Prize winner Lawrence Bragg for the British, and Dr. Bazzoni (later chief geophysicist of Sun Oil). In fact, when I got into sound ranging at Ft. Sill, Oklahoma, in March 1940, our recording gear was very comparable to what we had been using on Carter Oil's seismic party #3.

Harking back to Mintrop, Wallace Pratt personally advised me that Mintrop was a better salesman than oil finder. Moreover, Mintrop's U.S. interpreter was Sam Zimmerman, my first party chief and ultimately chief geophysicist for Aramco (circa 1963).

—CHARLES C. BATES
Green Valley, Arizona, USA

Extracted from THE LEADING EDGE April. 2006 Page 394

Reply by Gerhard Keppner:

After the successful test of Mintrop's device at the Wahn artillery test site in 1916, Ludendorff ordered the setting up of 100 units (troop, system, what is meant here is rather obvious). But there is a big difference between request and reality. Where to get trained people, where to get the material and the capacity for construction in that stage of war? For each station had to be run by a scientist, at least by specially trained people and some hands. In order to be mobile—an important aspect—each crew had to have at least one vehicle. (The crews might resemble the early refraction parties, with one advantage: They did not handle explosives, that was already done by the enemy guns.) There existed no "troops," and Mintrop was never the commander of those nonexistent troops.

In his history, Sweet writes a lot of amusing stories about the allied sound rangers: "... The first problem was to locate the position of the enemy guns and the second problem was to convince your artillery that they should train their fire on the position you had spotted." Amazing that Conrad Schlumberger worked as artillery officer on the French side, though Alsace was German at that time. (His brother Marcel was not a soldier.)

It wasn't Mintrop's job to find oil; his coworkers had to do this, and they did it with success. After a short intermezzo as party chief in the United States in 1923 for Marland Oil, as the boss of Seismos, he had to be manager and had to sell his crews—and nothing else. Sweet noted with some irony: "DeGolyer, Mintrop, and Karcher were all supersalesmen. Yet it is quite possible that Ludger Mintrop was the greatest of them all."

Sam Zimmerman is completely unknown here, and also the German version of this name: Zimmermann. The first party chief overseas in Mexico, Texas, and Louisiana was undoubtedly Otto Geussenhainer (neglecting the short Seismos activities in Europe before). After Geussenhainer there followed Mintrop, Trappe, Rellensmann, Cloos, Thomas, Mügge, Heise, Haubold, Roepke, von Helms, Schmidt, Kolb, etc.—all PhDs and most of them pupils of Emil Wiechert at Göttingen.

The profession of interpreter came into existence some decades later. In the beginning, the seismic results were solely interpreted by the party chiefs, the only people who were introduced into the then top-secret method.

Gerhard Keppner is in far off Germany (that means far off from Houston). How did we exist without the Internet and e-mail? He has added greatly to our knowledge of early exploration history so his comments about the new DVD, *Reflections in the Field*, are of significant interest. The DVD is formatted in PAL and NTSC, which will hopefully make it playable anywhere. In addition to *Reflections in the Field*, the DVD contains the complete version of *Seeing the Unseen* (a film SEG made in early 1980s) and PDF files of all of the "profile" articles that have appeared in *TLE* (and which will require a computer, rather than a DVD player, for viewing). If you want one, contact SEG's business office. It sells for \$15 for members and \$25 for nonmembers. As seen from Gerhard's comments, it is well worth it.

The SEG75 Anniversary DVD offers stuff for the rest of my life—i.e., 15 hours of highly concentrated geophysics. A special gold mine is "Profiles of Geophysicists." Each of the 76 vitae is a large chapter in the history of geophysics: multiple coverage, vibroseis, and a hundred other items personified and linked to names. And many of them, perhaps most, are written by Dolores Proubasta, a lady I highly respect and admire. (Honorary Membership to her!)

Reading the Crawford story, I found some of his landscapes, probably painted after his retirement. This reminded that, some years ago, when Rudolf Köhler, former publisher of the *Prakla-Rundschau* and the *PS-Report* (Prakla Seismos), came across Crawford's paintings, he burst into admiration. Spontaneously, he sent some of his own watercolors to Crawford and asked for critical judgment (and maybe for some praise). Crawford answered immediately, gave indeed some praise, some soft criticism, some hints and concluded with the advice:

"The foreground of a painting must always be dark, deep dark or even black." Henceforth handsome Rudi followed this advice.

Thanks, Gerhard. I wonder where the Crawford paintings are located. Anybody? Regarding your nomination for Honorary Membership: Dolores Proubasta has left the *TLE* staff and moved to Saudi Arabia with her fairly new husband, Chris Liner (former editor of *GEOPHYSICS* and another very popular *TLE* columnist). We are all hoping that she will regularly report on geophysics in that most important area of the oil industry.

Fortsetzung folgt?